Montana Department of
ENVIRONMENTAL QUALITY

Brian Schweitzer, Governor

P. O. Box 200901 Helena, MT 59620-0901 (406) 444-2544 Website: www.deq.mt.gov

PRELIMINARY DETERMINATION
ON PERMIT APPLICATION

Date of Mailing: December 16, 2008

Name of Applicant: Basin Electric Power Cooperative – Culbertson Generation Station

Source: Stationary, Simple-Cycle, Natural Gas-Fired Combustion Turbine Generator

Proposed Action: The Department of Environmental Quality (Department) proposes to issue a permit, with conditions, to the above-named applicant. The application was assigned Permit Application Number 4256-00.

Proposed Conditions: See attached.

Public Comment: Any member of the public desiring to comment must submit such comments in writing to the Air Resources Management Bureau (Bureau) of the Department at the above address. Comments may address the Department's analysis and determination, or the information submitted in the application. In order to be considered, comments on this Preliminary Determination are due by December 31, 2008. Copies of the application and the Department's analysis may be inspected at the Bureau's office in Helena. For more information, you may contact the Department.

Departmental Action: The Department intends to make a decision on the application after expiration of the Public Comment period described above. A copy of the decision may be obtained at the above address. The permit shall become final on the date stated in the Department's Decision on this permit, unless an appeal is filed with the Board of Environmental Review (Board).

Procedures for Appeal: Any person jointly or severally adversely affected by the final action may request a hearing before the Board. Any appeal must be filed by the date stated in the Department's Decision on this permit. The request for a hearing shall contain an affidavit setting forth the grounds for the request. Any hearing will be held under the provisions of the Montana Administrative Procedures Act. Submit requests for a hearing in triplicate to: Chairman, Board of Environmental Review, P.O. Box 200901, Helena, MT 59620.

For the Department,

Vickie Walsh

Vickie Walsh
Air Permitting Program Supervisor
Air Resources Management Bureau
(406) 444-3490

Brent Lignell
Environmental Engineer
Air Resources Management Bureau
(406) 444-5311

VW:BL
Enclosures

MONTANA AIR QUALITY PERMIT

Issued To: Basin Electric Power Cooperative 1717 East Interstate Ave. Bismarck, ND 58503-0564	Permit: #4256-00 Application Complete: November 6, 2008 Preliminary Determination Issued: December 16, 2008 Department's Decision Issued: Permit Final: AFS #: 085-0061

An air quality permit, with conditions, is hereby granted to Basin Electric Power Cooperative – Culbertson Generation Station (Basin Electric), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

SECTION I: Permitted Facilities

A. Permitted Equipment

Basin Electric proposes to construct and operate a stationary electric power generation station to provide power to the electric power grid during daily and seasonal periods of peak demand. This station will consist of a single, simple-cycle, combustion turbine generator (General Electric Model LMS100) powered by natural gas with a nominal power output capacity of 100 megawatts (MW). A complete list of permitted equipment is contained in Section I.A of the permit analysis.

B. Plant Location

The proposed electric power generation station will be located approximately 7.2 miles northeast of Culbertson, Montana, about 16 miles due west of the Montana-North Dakota border. The legal description is Section 5, Township 28 North, Range 57 East, Roosevelt County, Montana.

SECTION II: Conditions and Limitations

A. Emission Limitations

1. Emissions of nitrogen oxides (NOx) from the turbine generator shall not exceed 78.50 pounds per hour (lb/hr) based on a 1-hour average, effective during all periods of operation, including startup and shutdown (ARM 17.8.752).

2. Emissions of NOx from the turbine generator shall not exceed 25 parts per million dry volume (ppmvd) at 15% oxygen (O_2), effective during all periods of operation, including startup and shutdown (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

3. Emissions of carbon monoxide (CO) from the turbine generator shall not exceed 21.40 lb/hr based on a 1-hour average, effective during all periods of operation, including startup and shutdown (ARM 17.8.752).

4. Emissions of volatile organic compounds (VOCs) from the turbine generator shall not exceed 1.30 lb/hr based on a 1-hour average, effective during all periods of operation, including startup and shutdown (ARM 17.8.752).

5. The combined sum of filterable and condensable emissions of particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) from the turbine generator shall not exceed 6.00 lb/hr based on a 1-hour average, effective during all periods of operation, including startup and shutdown (ARM 17.8.752).

6. Operation of the turbine generator, including startup and shutdown, shall not exceed 3,400 hours per rolling 12-month time period (ARM 17.8.749).

7. Basin Electric shall operate and maintain a water-injection system to control NOx emissions during the combustion process. Water-injection shall commence within 10 minutes of turbine startup and shall continue until 10 minutes or less prior to shutdown (ARM 17.8.752).

8. Basin Electric shall install, operate, and maintain a catalytic oxidizer to control emissions of CO and VOCs (ARM 17.8.752).

9. Basin Electric shall combust only pipeline quality natural gas in the turbine generator (ARM 17.8.752).

10. The turbine shall exhaust into a stack that is at least 85.6-feet tall from grade (ARM 17.8.749).

11. Basin Electric shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

12. Basin Electric shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

13. Basin Electric shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.12 (ARM 17.8.749).

14. Basin Electric shall comply with all applicable standards and limitations, and the reporting, recordkeeping and notification requirements contained in 40 CFR 60, Subpart KKKK (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

B. Testing Requirements

1. Basin Electric shall test the turbine generator, using natural gas as a fuel, for NOx and CO, concurrently, within 180 days of initial startup of the turbine generator, or according to another testing/monitoring schedule as may be approved by the Montana Department of Environmental Quality (Department), to demonstrate compliance with the NOx and CO emission limits contained in Sections II.A.1, II.A.2, and II.A.3. The testing shall continue on an every 2-year basis, or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and 17.8.749).

2. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

3. The Department of Environmental Quality (Department) may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

1. Basin Electric shall supply the Department with annual production information for all emission points**,** as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. Basin Electric shall notify the Department of any construction or improvement project conducted, pursuant to ARM 17.8.745, that would include ***the addition of a new emissions unit***, change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to startup or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by Basin Electric as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

4. Basin Electric shall document, by month, the hours of operation for the turbine generator, including startup and shutdown. By the 25th day of each month, Basin Electric shall total the hours of operation for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.6. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

E. Continuous Emissions Monitoring Systems

1. Basin Electric shall install, certify, maintain, and operate a continuous emission monitoring system (CEMS) consisting of a NOx monitor and a diluent gas (oxygen (O_2) or carbon dioxide (CO_2)) monitor, to determine the hourly NOx emission rate in ppm (ARM 17.8.749, ARM 17.8.340, and 40 CFR 60, Subpart KKKK).

2. Basin Electric shall comply with all applicable requirements of 40 CFR 60, Subpart KKKK, including requirements for CEMS installation, certification, quality assurance, and relative accuracy and performance testing (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

F. Notification

Basin Electric shall provide the Department with written notification of the following information within the specified time periods (ARM 17.8.749):

1. Commencement of construction of the Basin Electric power generation facility within 15 working days after beginning of construction.

2. Actual startup date of the turbine generator within 15 working days after the actual startup of the turbine generator.

SECTION III: General Conditions

A. Inspection – Basin Electric shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if Basin Electric fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Basin Electric of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq*., MCA, and ARM 17.763.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by Basin Electric may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Construction Commencement – Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).

Attachment 2

INSTRUCTIONS FOR COMPLETING EXCESS EMISSION REPORTS (EER)

PART 1 Complete as shown. Report total time during the reporting period in hours. The determination of plant operating time (in hours) includes time during unit startup, shutdown, malfunctions, or whenever pollutants of any magnitude are generated, regardless of unit condition or operating load.

Excess emissions include all time periods when emissions, as measured by the CEMS, exceed any applicable emission standard for any applicable time period.

Percent of time in compliance is to be determined as: (1 – (total hours of excess emissions during reporting period / total hours of CEMS availability during reporting period)) x 100

PART 2 Complete as shown. Report total time the point source operated during the reporting period in hours. The determination of point source operating time includes time during unit startup, shutdown, malfunctions, or whenever pollutants (of any magnitude) are generated, regardless of unit condition or operating load.

Percent of time CEMS was available during point source operation is to be determined as: (1–(CEMS downtime in hours during the reporting period* /total hours of point source operation during reporting period)) x 100

* All time required for calibration and to perform preventative maintenance must be included in the CEMS downtime.

PART 3 Complete a separate sheet for each pollutant control device. Be specific when identifying control equipment operating parameters. For example: number of TR units, energizers for electrostatic precipitators (ESP); pressure drop and effluent temperature for baghouses; and bypass flows and pH levels for scrubbers. For the initial EER, include a diagram or schematic for each piece of control equipment.

PART 4 Use Table I as a guideline to report all excess emissions. Complete a separate sheet for each monitor. Sequential numbering of each excess emission is recommended. For each excess emission, indicate: 1) time and duration, 2) nature and cause, and 3) action taken to correct the condition of excess emissions. Do not use computer reason codes for corrective actions or nature and cause; rather, be specific in the explanation. If no excess emissions occur during the quarter, it must be so stated.

PART 5 Use Table II as a guideline to report all CEM system upsets or malfunctions. Complete a separate sheet for each monitor. List the time, duration, nature and extent of problems, as well as the action taken to return the CEM system to proper operation. Do not use reason codes for nature, extent or corrective actions. Include normal calibrations and maintenance as prescribed by the monitor manufacturer. Do not include zero and span checks.

PART 6 Complete a separate sheet for each pollutant control device. Use Table III as a guideline to report operating status of control equipment during the excess emission. Follow the number sequence as recommended for excess emissions reporting. Report operating parameters consistent with Part 3, Subpart e.

PART 7 Complete a separate sheet for each monitor. Use Table IV as a guideline to summarize excess emissions and monitor availability.

PART 8 Have the person in charge of the overall system and reporting certify the validity of the report by signing in Part 8.

EXCESS EMISSIONS REPORT

PART 1

a. Emission Reporting Period ____

b. Report Date ____

c. Person Completing Report ____

d. Plant Name ____

e. Plant Location ____

f. Person Responsible for Review and Integrity of Report ______________________

g. Mailing Address for 1.f. ____

h. Phone Number of 1.f. ____

i. Total Time in Reporting Period ____

j. Total Time Plant Operated During Quarter ______________________________

k. Permitted Allowable Emission Rates: Opacity ____________________________

SO2 ____________ NOx ____________ TRS ____________

l. Percent of Time Out of Compliance: Opacity ____________________________

SO2 ____________ NOx ____________ TRS ____________
_

m. Amount of Product Produced During Reporting Period ______________________

n. Amount of Fuel Used During Reporting Period ____________________________

PART 2 – Monitor Information (Complete for each monitor).

a. Monitor Type (circle one): Opacity SO2 NOx O2 CO2 TRS Flow

b. Manufacturer ____

c. Model No. ____

d. Serial No. ____

e. Automatic Calibration Value: Zero ____________ Span ____________

f. Date of Last Monitor Performance Test ______________________________

g. Percent of Time Monitor Available:

1) During reporting period ____

2) During plant operation ____

h. Monitor Repairs or Replaced Components Which Affected or Altered Calibration Values ________

____

i. Conversion Factor (f-Factor, etc.) ____

j. Location of monitor (e.g. control equipment outlet)____

PART 3 - Parameter Monitor of Process and Control Equipment. (Complete one sheet for each pollutant.)

a. Pollutant (circle one): Opacity SO2 NOx TRS

b. Type of Control Equipment ____

c. Control Equipment Operating Parameters (i.e., delta P, scrubber water flow rate, primary and secondary amps, spark rate)____

____

d. Date of Control Equipment Performance Test ____

e. Control Equipment Operating Parameter During Performance Test ________________________

____

____

____

____

PART 4 – Excess Emission (by Pollutant)

Use Table I: Complete table as per instructions. Complete one sheet for each monitor.

PART 5 – Continuous Monitoring System Operation Failures

Use Table II: Complete table as per instructions. Complete one sheet for each monitor.

PART 6 – Control Equipment Operation During Excess Emissions

Use Table III: Complete as per instructions. Complete one sheet for each pollutant control device.

PART 7 – Excess Emissions and CEMS performance Summary Report

Use Table IV: Complete one sheet for each monitor.

PART 8 – Certification for Report Integrity, by person in 1.f.

THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THE INFORMATION PROVIDED IN THE ABOVE REPORT IS COMPLETE AND ACCURATE.

SIGNATURE ______________________________

NAME ______________________________

TITLE ______________________________

DATE ______________________________

TABLE I

EXCESS EMISSIONS

Date	Time			Magnitude	Explanation/Corrective Action
	From	To	Duration		

TABLE II

CONTINUOUS MONITORING SYSTEM OPERATION FAILURES

Date	Time			Problem/Corrective Action
	From	To	Duration	

TABLE III

CONTROL EQUIPMENT OPERATION DURING EXCESS EMISSIONS

Date	Time			Operating Parameters	Corrective Action
	From	To	Duration		

TABLE IV

EXCESS EMISSIONS AND CEMS PERFORMANCE SUMMARY REPORT

Pollutant (circle one): SO2 NOx TRS H2S CO Opacity

Monitor ID ____________________

Emission data summary [1]	CEMS performance summary [1]
1. Duration of excess emissions in reporting period due to: a. Startup/shutdown b. Control equipment problems c. Process problems d. Other known causes e. Unknown causes 2. Total duration of excess emissions 3. Total duration of excess emissions / Total time CEM operated × 100 =	1. CEMS[2] downtime in reporting due to: a. Monitor equipment malfunctions b. Non-monitor equipment malfunctions c. Quality assurance calibration d. Other known causes e. Unknown causes 2. Total CEMS downtime 3. Total CEMS downtime / Total time source emitted × 100 =

1. For opacity, record all times in minutes. For gases, record all times in hours. Fractions are acceptable (e.g., 4.06 hours)
2. CEMS downtime shall be regarded as any time CEMS is not measuring emissions.

Permit Analysis
Basin Electric Power Cooperative – Culbertson Generation Station
Permit #4256-00

I. Introduction/Process Description

Basin Electric Power Cooperative (Basin Electric) proposes to construct and operate a stationary electric power generation station to provide power to the electric power grid during daily and seasonal periods of peak power demand. The facility is located approximately 7.2 miles northeast of Culbertson, Montana, about 16 miles due west of the Montana-North Dakota border. The legal description is Section 5, Township 28 North, Range 57 East, Roosevelt County, Montana. The facility is known as the Culbertson Generation Station.

A. Permitted Equipment

The proposed project would consist of a single General Electric LMS100 turbine generator. This turbine generator is a nominal 100-megawatt (MW), simple-cycle, combustion turbine generator that runs solely off natural gas. The GE LMS100 was chosen for its generation capacity, startup response time, and thermal efficiency not available in other power generation turbines of comparable capacity.

B. Source Description

The generation plant will house a single, simple-cycle, aeroderivative combustion turbine and an electric generator driven by the turbine. The turbine draws in combustion air which is compressed and mixed with natural gas. The fuel-air mixture is ignited to produce compressed hot combustion gases which expand and rotate a shaft which turns a generator to produce electricity. The turbine will combust only natural gas which will be supplied by an existing pipeline running through the Basin Electric property.

Emissions will be limited by permit conditions that restrict operation of the turbine to no more than 3,400 hours per year. Oxides of nitrogen (NOx) emissions will be controlled by the combustion of pipeline quality natural gas and water injection during combustion. The facility will not incorporate add-on controls for emissions of sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), or particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$). Basin Electric is required by permit to combust only pipeline quality natural gas, which will result in reduced SO_2 and PM_{10} emissions. A catalytic oxidizer will treat post-combustion exhaust emissions to reduce carbon monoxide (CO) and volatile organic compounds (VOC).

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

   Based on the emissions from the turbine, the Department determined that initial testing for NOx and CO is necessary. Furthermore, based on the emissions from the turbine, the Department determined that additional testing every 2 years is necessary to demonstrate compliance with the NOx and CO emission limit.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, et seq., Montana Code Annotated (MCA).

   Basin Electric shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

   1. ARM 17.8.204 Ambient Air Monitoring
   2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
   3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
   4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
   5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
   6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
   7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
   8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
   9. ARM 17.8.222 Ambient Air Quality Standard for Lead
   10. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

   Basin Electric must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

   1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, Basin Electric shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

6. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.

7. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

8. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). The turbine generator is considered an NSPS affected facility under 40 CFR Part 60 and is subject to the requirements of the following subparts.

   a. 40 CFR 60, Subpart A – General Provisions. This subpart applies to all equipment or facilities subject to an NSPS Subpart as listed below:

   b. 40 CFR 60, Subpart KKKK – Standards of Performance for Stationary Combustion Turbines. This subpart applies to the proposed facility because Basin Electric proposes to install and operate a stationary combustion turbine with a heat input greater than 10 million British thermal units (MMBtu) per hour, which commenced construction, modification, or reconstruction after February 18, 2005.

9. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. This source shall comply with the standards and provisions of 40 CFR Part 61, as appropriate.

10. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR Part 63, shall comply with the requirements of 40 CFR Part 63, as listed below:

    a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to an NESHAP Subpart as may be listed below:

    b. 40 CFR 63, Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines: This subpart applies to stationary combustion turbines located at a major sources of hazardous air pollutant (HAP) emissions which emits any single HAP at a rate of at least 10 tons per year (TPY), or a combination of HAPs of at least 25 TPY. This subpart does not apply to the Basin Electric combustion turbine generator because emissions of no single HAP meet or exceed 10 TPY, and any combination of HAPs do not meet or exceed 25 TPY.

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.402 Requirements. Basin Electric must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed height of the new or altered stack for the turbine generator is below the allowable 65-meter GEP stack height.

E. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. Basin Electric submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

F. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. The Basin Electric facility has a PTE greater than 25 TPY for NOx and CO; therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. Basin Electric submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. Basin Electric submitted an affidavit of publication of public notice for the August 28, 2008, issue of the *Searchlight*, a newspaper of general circulation in the Town of Culbertson, in the County of Roosevelt, as proof of compliance with the public notice requirements. Due to an error in the facility location as printed in the public notice, Basin Electric published a second public notice in the November 20, 2008, issue of the *Searchlight* to correct the error. Basin Electric submitted an affidavit of publication of public notice for the November 20, 2008, issue of the *Searchlight*, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT (best available control technology) shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Basin Electric of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.760 Additional Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those applications that require an environmental impact statement.

12. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

13. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

14. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

15. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.

G. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

   This facility is not a major stationary source because this facility is not a listed source and the facility's PTE is below 250 tons per year of any pollutant (excluding fugitive emissions).

H. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. PTE > 100 TPY of any pollutant;

   b. PTE > 10 TPY of any one HAP, PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

   c. PTE > 70 TPY of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #4256-00 for Basin Electric, the following conclusions were made:

   a. The facility's PTE is greater than 100 TPY for NOx.

   b. The facility's PTE is less than 10 TPY for any one HAP and less than 25 TPY for all HAPs.

c. This source is not located in a serious PM_{10} nonattainment area.

d. This facility is subject to a current NSPS (40 CFR 60, Subpart KKKK – Standards of Performance for Stationary Combustion Turbines).

e. This facility is not subject to any current NESHAP standards.

f. This source is a Title IV affected source; however, it is not a solid waste combustion unit.

g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that Basin Electric is subject to the Title V operating permit program. Basin Electric applied for a Title V Operating Permit concurrent to the current MAQP application.

III. BACT Determination

A BACT determination is required for each new or altered source. Basin Electric shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was submitted by Basin Electric in the application for Permit #4256-00, addressing some available methods of controlling NOx, CO, VOC, PM, PM_{10}, and $PM_{2.5}$ emissions from the turbine generator. A summary of the Basin Electric BACT analysis is included below. The Department reviewed these methods, as well as previous BACT determinations. The following control options have been reviewed by the Department in order to make the following BACT determination. The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

The BACT determination accounts for the fact that the GE LMS100 was specifically chosen for its generation capacity, startup response time, and thermal efficiency not available in other power generation turbines of comparable capacity. Thus, BACT was determined based on features available for this particular generating unit.

A. NOx BACT

NOx is formed during the combustion of natural gas. The formation of NOx is dominated by the process called thermal NOx formation. Thermal NOx results from the thermal fixation of atmospheric nitrogen and oxygen in the combustion air. The rate of formation is sensitive to local flame temperature and local oxygen conditions.

The BACT analysis included analyzing the following controls: dry low NOx burners, catalytic combustion, selective non-catalytic reduction, scrubbers, selective catalytic reduction, catalytic adsorption, and water or steam injection. A summary of the analysis of these controls is provided below.

1. Dry Low NOx Burners

Dry low NOx (DLN) burners are a combustion process modification. DLN burners lower the combustion temperatures in the turbine, thereby reducing thermal NOx formation. This is accomplished by premixing fuel and combustion air at a stoichiometric deficit of fuel prior to injection into the compressor. Additional fuel is then injected in stages throughout the combustion chamber of the turbine, producing a lower heating value air/fuel mixture that will combust at lower temperatures, thereby reducing thermal NOx formation.

A DLN version of the GE LMS100 will not be available until the latter part of 2009, at the earliest. The DLN version of the LMS100 is expected to emit NOx at a rate similar to the current water injection version proposed for the Basin Electric facility. The primary advantage of the DLN version over the water injection version is relief from having to secure, process, and dispose of approximately 100 gallons of water per minute. The LMS100 is preferable to other turbine generators that can accommodate DLN because of the relatively high thermal efficiency of the LMS100, its ability to quickly supply peak power, and its ability to maintain suitable efficiency at low loads.

Basin Electric has chosen the GE LMS100 as the optimum turbine to meet the particular objectives of the project. Because the DLN burner technology is not commercially available for the LMS100 at this time, and because DLN-accommodating turbine generators from other manufacturers do not meet the required performance specifications, the DLN burner is not technically feasible for application to this project.

2. Catalytic Combustion

Catalytic combustion is a combustion process modification. Catalytic combustion uses a catalyst to react fuel with air at a lower temperature than normal combustion, resulting in reduced NOx formation. The technology, known by the trade name XONON ™, was originally developed by Catalytica Energy Systems, Inc., but is now licensed to Kawasaki Heavy Industries. A lean mix of air and fuel is combusted in a premixing burner to heat the incoming combustion air. More fuel is then mixed into the incoming air and reacted on a catalyst surface without flame, combusting the mixture at relatively lower temperatures and producing little NOx.

This technology has only been commercially demonstrated on a single combustion turbine – a Kawasaki 1.5 MW natural gas turbine that provides base load power to a municipal utility in California. XONON ™ is only available on Kawasaki's GPB15X, 1.4 MW baseload turbine. Because the XONON ™ is not more broadly demonstrated and is unavailable for application on mid-size turbines, it is not technically feasible for application to this project.

3. Selective Non-Catalytic Reduction

Selective non-catalytic reduction (SNCR) is a post-combustion treatment process that converts NOx to molecular nitrogen and water. SNCR uses reducing agents such as ammonia or urea to achieve the conversion. However, since a catalyst is not used to lower the activation energy, the reaction requires much higher temperatures, typically between 1650 °F and 1800 °F. NOx reduction ranges from 30 to 50%, but the conversion efficiency decreases rapidly outside of this temperature range, which may result in emissions of unreacted ammonia and excess NOx.

The high temperatures required for operation of SNCR significantly exceed the exhaust temperatures generated by the GE LMS100, which typically range from 740 °F to 840 °F. Because the exhaust temperature requirements are not sufficient, SNCR is not technically feasible for application to this project.

4. Wet Chemistry Scrubber (LoTOx™)

Belco Technologies Corporation's LoTOx™ is a post-combustion treatment process for NOx control. LoTOx™ uses an ozone generator to inject oxygen into the exhaust gas stream to create higher-order NOx that is highly soluble in water. The soluble NOx is removed from the exhaust with a wet scrubber. The estimated control efficiency is 80-90% NOx removal.

A LoTOx^{TM} system requires an oxygen and water supply, as well as a system for treating and disposing scrubber effluent. It was primarily designed for high particulate emissions and high sulfur fuel, which are not typical of the combustion environment of a natural gas-fired turbine. LoTOx^{TM} has only been demonstrated on pilot scale projects, none of which include combustion turbines. A review of EPA's RACT/BACT/LAER Clearinghouse (RBLC) indicates three facilities nationwide that use LoTOx^{TM} for NOx control: a steal foundry, an acid regeneration plant, and a refinery. Due to the lack of commercial application for similar sources, this technology is not considered commercially available or demonstrated for the Basin Electric project, and thus does not constitute BACT.

5. Selective Catalytic Reduction

Selective catalytic reduction (SCR) is a post-combustion treatment process that converts NOx in an exhaust stream to molecular nitrogen, water, and oxygen. Ammonia is the reducing agent used to achieve the conversion, and is injected into the exhaust upstream of a catalyst bed which reduces the activation energy necessary for the reaction to occur. SCR achieves optimal performance at flue gas temperatures between 575 °F and 750 °F. Excess air is injected at the turbine exhaust as needed to reduce temperatures to the optimum range. NOx reduction ranges from 70 to 90%.

The use of SCR may have negative environmental impacts. Emissions of unreacted ammonia may reach 5 ppm at the input levels required to control NOx. Another consequence is the formation of ammonium sulfate, a constituent of particulate matter. Furthermore, the transportation, storage, and handling of ammonia are potentially hazardous activities. In terms of energy impacts, SCR in the exhaust train increases system backpressure, thus reducing power output.

Basin Electric calculated the cost efficiency of SCR to be $31,100 per ton of NOx removed. Though environmental and energy impacts alone are not sufficient to disqualify SCR as BACT, the incremental cost per ton of NOx removed is disproportionately high when compared to the cost of NOx control required of other similar sources. U.S. EPA Region 4 maintains a database of combustion turbine projects and identifies nine projects that eliminated SCR for a simple-cycle turbine based on excessive cost (accessed by Department on September 23, 2008, http://www.epa.gov/region4/air/permits/; Download the *National Combustion Turbine Spreadsheet maintained by Region 4 staff*, MS Excel version). For these nine projects, the highest control cost was $15,600/ton NOx, in contrast to $31,000/ton for the Basin Electric facility. Two simple-cycle projects in the Region 4 database did apply SCR, but were not similar applications (one project used distillate oil as the primary fuel, the other operated much larger turbines). Because of the relatively excessive cost efficiency when compared to similar applications, SCR is not economically feasible for this project.

6. Catalytic Adsorption (EMx^{TM})

EMx^{TM}, formerly marketed as SCONOx^{TM}, is a multi-pollutant, post-combustion treatment process that uses a single catalyst to simultaneously limit emissions of CO, VOC, and NOx. The catalyst oxidizes NO to NO_2; the NO_2 then adsorbs on a potassium carbonate coating applied to the catalyst surface. The NO_2 reacts to form potassium nitrate and potassium nitrite salts. The salts are reduced to elemental nitrogen and water by introducing steam, CO_2, and natural gas.

The EMx[TM] reactions result in a buildup of reaction products that must be removed to complete the conversion of NOx and regenerate the catalyst. This process requires steam, making the technology for more suitable for combined-cycle turbines which generate steam. Because the Basin Electric facility would have to generate steam, the facility would have to combust additional fuel, offsetting benefits of emission controls. Furthermore, the technology provides approximately the same NOx control as SCR, but is approximately three times the cost of SCR. Because the same NOx control can be achieved with a significantly less costly alternative, the Department determined that EMx[TM] does not constitute BACT for this project.

7. Water or Steam Injection

Water or steam injection is a combustion process modification. The injection of water or steam lowers the combustion temperature in the turbine, thereby reducing thermal NOx formation. NOx reduction is proportional to the amount of water injected during operation. An additional benefit is increased air density at the turbine inlet, which increases mass flow through the turbine and associated power output. NOx reduction is generally balanced by an increase in CO and VOC emissions since lower flame temperatures tend to promote incomplete combustion. However, post-combustion controls may be added to minimize CO/VOC emissions.

The GE LMS100 turbine used for this project is equipped with water injection as an integral feature of the turbine design. Water injection cannot commence immediately upon turbine startup, but is fully effective within 10 minutes of startup. Similarly, water injection will cease 10 minutes prior to shutdown. According to the manufacturer, water injection controls NOx emissions to 25 parts per million dry volume (ppmvd) at 15% oxygen (O_2) at the worst-case operating capacity (100% load).

Basin Electric proposes that use of water injection during combustion constitutes BACT for control of NOx emissions. The Department concurs that use of water injection during combustion constitutes BACT in this case because the emissions from the turbine are relatively low and the incremental cost to incorporate additional control is disproportionately high when compared to the cost of NOx control required of other similar sources. The Department also concurs with the proposed limit of 25 ppmvd over a one-hour averaging period, effective during all periods of operation, including startup and shutdown, in addition to an hourly limit of 78.5 lb/hr as constituting BACT. Compliance would be demonstrated using a continuous emissions monitoring system (CEMS).

B. CO/VOC BACT

Because CO and VOCs are controlled by the same mechanisms, this section addresses them collectively. CO and VOCs are formed from the incomplete combustion of organic constituents of natural gas. In an ideal process, the complete combustion, or oxidation, of organics results in the emission of water and carbon dioxide (CO_2). When organic compounds do not oxidize completely, the result is CO and various VOCs. Two general approaches are available for reducing emissions of these compounds: 1) Improve combustion conditions to facilitate complete combustion in the turbine burner, and 2) complete the oxidation of the exhaust stream after it leaves the turbine burner. Post-combustion CO/VOC control is accomplished via add-on equipment that creates an oxygen-rich, high-temperature environment to promote complete combustion. This can be facilitated at relatively lower temperatures by the use of certain catalyst materials.

The BACT analysis revealed three control technologies with a practical potential for application to the Basin Electric facility. These technologies include thermal oxidation, catalytic oxidation, and proper system design and operation. A summary of the analysis of these controls is provided below.

1. Thermal Oxidation

   Thermal oxidizers are essentially supplementary combustion chambers that complete the conversion of CO/VOC to CO_2 and water by creating a high-temperature environment (1800 °F to 2000 °F) with optimal oxygen concentration, mixing, and residence time. A commonly used design is the regenerative thermal oxidizer (RTO), which uses a bed of ceramic packing material to capture heat from the burner process and preheat the incoming exhaust gas. RTOs are capable of reducing CO/VOC emissions by 95 to 99%.

   The high-temperature environment is produced by combustion of supplemental fuel, generally natural gas, which results in a small amount of additional CO and NOx. The Basin Electric BACT analysis estimates an additional 1.2 tons of CO and 1.5 tons of NOx per year as a result of operating an RTO at the Basin Electric facility.

   Assuming a control efficiency of 95% for an RTO, and a maximum operating schedule of 3,400 hours per year, the cost-effectiveness of an RTO in this application would be approximately $6,300 per ton of CO removed, and $102,000 per ton of VOC removed. The marginal cost of RTO relative to the next most effective alternative, in this case catalytic oxidation, is $26,300 per ton of incremental CO removed by using RTO instead of a catalytic oxidizer. The marginal cost of VOC is $3,000,000 per ton of incremental VOC removed by using RTO instead of catalytic oxidation.

   A review of the EPA RBLC database indicated that RTO is not a common application for control of CO/VOC for turbine combustion generators. Furthermore, the economic impact of using RTO is considered disproportionately adverse relative to other recent BACT determinations. Therefore RTO is not considered BACT for this application.

2. Catalytic Oxidation

   Catalytic oxidizers employ the same principles as thermal oxidizers, but use catalysts to lower the temperature required to achieve complete combustion. The optimum temperature range for catalytic oxidizers is generally 600 °F to 900 °F. Catalysts are prone to plugging and poisoning, so are located downstream of particulate matter control devices. The Basin Electric facility will combust natural gas, so particulate loading is not anticipated to be a problem. A common design is the regenerative catalytic oxidizer (RCO), which improves thermal efficiency via methods similar to RTO. RCOs achieve removal efficiencies of 90 to 99%.

   Assuming a control efficiency of 90% for an RCO, and a maximum operating schedule of 3,400 hours per year, the cost-effectiveness of an RCO in this application would be approximately $5,300 per ton of CO removed, and $85,200 per ton of VOC removed.
   A review of the EPA RBLC database indicated that catalytic oxidation is commonly used for combustion turbine generator applications similar to the Basin Electric facility.

   The Department concurs with Basin Electric's determination that catalytic oxidation constitutes BACT for CO/VOC for the turbine generator application. The proposed limits of 11.3 ppmvd CO and 1.25 ppmvd VOC, corrected to 15% O_2 over a 1-hour averaging period, would be effective during all periods of operation, including startup and shutdown. Compliance would be demonstrated by initial testing followed by testing as required by the Department.

3. Proper System Design and Operation / No Additional Control

   Reduction of CO/VOC emissions can be accomplished by operating at maximum loads, increasing oxygen concentrations, maximizing combustion residence time, and improving mixing. However, all of these techniques generally increase NOx emissions. Proper system design and operation serves as the baseline for CO/VOC emissions reduction and is thus technically feasible. A review of the EPA RACT/BACT/LAER Clearinghouse demonstrated that proper system design and operation, without addition control, is not a suitable control for natural gas combustion turbine generators. Therefore, "no additional control" is not considered BACT for this application.

C. $PM/PM_{10}/PM_{2.5}$ BACT

Technologies for reducing emissions of particulate matter include centrifugal collectors, wet and dry electrostatic precipitators, fabric filters, wet scrubbers, fuel selection, and proper system design and operation. A summary of the analysis of these controls is provided below.

1. Centrifugal Separators

   Centrifugal separators, or "cyclones", are commonly used as a prefilter before a primary particulate control device. They are often used to capture and recycle high-value process material. Cyclones are generally more effective at removing larger particles than smaller ones. At high removal rates, power requirements increase due to increased pressure drop.

   Uncontrolled emissions of particulate matter from the Basin Electric facility would be relatively low due to the use of natural gas. Assuming a control efficiency of 95% and a cost of $1.30 per standard cubic foot of treated exhaust, the cost-effectiveness of a centrifugal separate in this application would be approximately $14,370 per ton of PM removed. Though technically feasible, a centrifugal separator poses excessive costs that preclude its use as BACT.

2. Electrostatic Precipitators

   An electrostatic precipitator (ESP) is a particulate control device that uses electric forces to move particles out of the gas stream an on to collector plates. The particles are given an electric charge by forcing them to pass a region of gaseous ion flow. High voltage electrodes spaced throughout the exhaust stream create an electric field that forces the charged particles to the collector plates.

   Advantages of an ESP include very high collection efficiencies (90 to 99%) and the ability to process relatively large gas volumes. Disadvantages include high capital cost, operational flexibility, and overall size of the equipment. Though technically feasible, the control cost for an ESP exceeds the cost calculated for the centrifugal separator. Because of the large volume of gas required to be treated and the cost of this control technology compared to the relatively low uncontrolled emissions of particulate matter, the cost would be prohibitive. For these reasons, ESP does not constitute BACT for control of particulate emissions.

3. Fabric Filter Baghouses

   Fabric filter baghouses (FFB) consist of one or more isolated compartments containing rows of fabric filter bags or tubes. Gas flows through the fabric but particulate is retained on the upstream face of the bag. Filter is accomplished through a combination of inertial impaction, impingement, and accumulated dust cake sieving. The captured particulate is typically removed from filters via pneumatic pulses or mechanical shakers. FFBs are capable of reducing filterable particulate matter by up to 99%.

   Disadvantages include limits on exhaust temperatures above 550° F, high-pressure drops, difficulty with corrosive or sticky particulates, and minimal capture efficiency for condensable matter. Thought technically feasible, the control cost for an FFB exceeds the cost calculated for the centrifugal separator and would be cost-prohibitive. For this reason, FFB does not constitute BACT for control of particulate emissions.

4. Wet Scrubbers

   Wet scrubbers typically use water to impact, intercept, or diffuse a particulate-laden gas stream. With impaction, particulate matter is accelerated and impacted onto a surface area or into a liquid droplet through devices such as venturis and spray chambers. When using interception, particles flow nearly parallel to the water droplets which allow the water to intercept the particles. Diffusion is used for particles smaller than 0.5 microns and where there is a high temperature difference between the gas and the scrubbing liquid. The particles migrate through a spray along line of irregular gas density and turbulence, contacting droplets of approximately equal energy.

   For particles smaller than 3 microns, a high density of small liquid droplets is needed to trap the particles. This is done at the price of high-energy consumption due to hydraulic or velocity pressure losses. Though technically feasible, the control cost for wet scrubber exceeds the cost calculated for the centrifugal separator and would therefore be cost-prohibitive. For this reason, a wet scrubber does not constitute BACT for control of particulate emissions.

5. Fuel Selection / No Additional Control

   Particulate emissions from the simple-cycle combustion turbine result from inorganic compounds contained in the fuel and incomplete combustion of organic compounds. Condensable particulate formation is also a function of impurities in the fuel. Rates of filterable and condensable particulate emission are inherently low when combusting natural gas because it is relatively free of inorganic impurities and combusts efficiently.

   The high volumetric flow rate of gas through the turbine, with relatively low particulate loading from the use of natural gas, makes the total annual cost of any other control equipment cost prohibitive. A review of the EPA RBLC database indicated that the use of natural gas and good combustion practices is commonly used for control of particulates at facilities similar to the Basin Electric facility. For these reasons, the use of natural gas, proper design and operation, "no additional control" will constitute BACT for particulate emissions from the turbine. The maximum emission rate will be 6.00 lb/hr for PM_{10} and 6.00 lb/hr for $PM_{2.5}$. Limits would be effective during all periods of operation, including startup and shutdown. Compliance would be demonstrated by certified use of pipeline quality natural gas, and/or testing as required by the Department.

D. Sulfur Dioxide BACT

Sulfur dioxide (SO_2) emissions from the Basin Electric facility are relatively minor (1.9 TPY). Basin Electric proposed no additional control (combusting only pipeline quality natural gas) as BACT. Due to the low amount of SO_2 emitted from the facility, control equipment would be cost prohibitive. Therefore, the Department concurs with Basin Electric's proposal and determined that no additional control (combusting only pipeline quality natural gas) constitutes BACT.

IV. Emission Inventory

	Tons per Year [1]						
Emission Source	**PM [2]**	**PM_{10} [3]**	**$PM_{2.5}$ [3]**	**NO_x**	**CO**	**VOC**	**SO_2**
Natural Gas Turbine	2.9	10.2	10.2	133.5	36.5	2.3	1.9
Haul Roads	2.5	0.7	--	--	--	--	--
Total Emissions	**5.4**	**10.9**	**10.2**	**133.5**	**36.5**	**2.3**	**1.9**

1. Inventory based on permit conditions that limit turbine operation to 3,400 hours per year and a maximum rated design capacity of 738.1 MMBtu/hr.
2. Filterable particulate matter only.
3. Combined sum of filterable and condensable particulates. It is assumed that all particulates are less than 2.5 microns due to combustion properties of natural gas; thus PM_{10}=$PM_{2.5}$.

GE LMS100 Turbine Generator

PM Emissions (Filterable only)

Note: "Filterable PM" emissions in this inventory refers to the particulate matter collected in the "front-half" of the U.S. EPA Method 5 reference test (40 CFR Part 60, Appendix A), which collects PM from the probe and filter. This does not include the material that condenses in the impinger. The filterable PM emission factor was derived from the GE-reported worst-case uncontrolled emissions for PM_{10} and $PM_{2.5}$ (assumed equivalent since most particulates will be less than 2.5 microns). However, because the GE value for $PM_{10/2.5}$ represents the sum of condensable and filterable particulate matter (i.e., Total PM) the component of filterable PM was determined using a ratio of filterable-to-total PM based on AP-42 emission factors for gas-fired turbine generators (AP-42, Table 3.1-2a, 4/00). Detailed calculations are provided below.

Total $PM_{10/2.5}$ (filterable + condensable) = 6.0 lb/hr (uncontrolled, GE data)
Turbine Maximum Heat Input = 738.1 MMBtu/hr
Total $PM_{10/2.5}$ Emission Factor for the GE LMS100 = 6.0 lb/hr ÷ 738.1 MMBtu/hr = 0.0081 lb/MMBtu.

Calculations for ratio of filterable-to-total PM based on AP-42 emission factors for stationary gas turbines:
Condensable PM = 0.0047 lb/MMBtu (water-steam injection per footnote l, AP-42, Table 3.1-2a, 4/00)
Filterable PM = 0.0019 lb/MMBtu (water-steam injection per footnote l, AP-42, Table 3.1-2a, 4/00)
Total PM = 0.0066 lb/MMBtu (water-steam injection per footnote l, AP-42, Table 3.1-2a, 4/00)
Ratio of filterable-to-total PM = 0.0019 lb/MMBtu ÷ 0.0066 lb/MMBtu = 0.288

Apply ratio to GE factor for total PM to obtain filterable PM emission factor:
Filterable PM emission factor = 0.288 * 0.0081 lb/MMBtu = 0.0023 lb/MMBtu

Inventory calculation:
(3400 hrs) * (738.1 MMBtu/hr) * (0.0023 lb/MMBtu) * (0.0005 tons/lb) = 2.94 tons

PM_{10} Emissions (Filterable and condensable)

Emission factor derived based on the GE-reported worst-case uncontrolled PM of 6.0 lb/hr:
6.0 lb/hr ÷ 738.1 MMBtu/hr = 0.0081 lb/MMBtu.
Calculation: (3400 hrs) * (738.1 MMBtu/hr) * (0.008129 lb/MMBtu) * (0.0005 tons/lb) = 10.20 tons

$PM_{2.5}$ Emissions (Filterable and condensable)

Emission factor derived based on the GE-reported worst-case uncontrolled PM of 6.0 lb/hr:
6.0 lb/hr ÷ 738.1 MMBtu/hr = 0.008129 lb/MMBtu.
Calculation: (3400 hrs) * (738.1 MMBtu/hr) * (0.008129 lb/MMBtu) * (0.0005 tons/lb) = 10.20 tons

NOx Emissions

Emission factor derived based on the GE-reported worst-case NOx of 78.53 lb/hr with water injection:
78.53 lb/hr ÷ 738.1 MMBtu/hr = 0.1064 lb/MMBtu.
Calculation: (3400 hrs) * (738.1 MMBtu/hr) * (0.1064 lbs/MMBtu) * (0.0005 tons/lb) = 133.51 tons

CO Emissions

Emission factor derived based on the GE-reported worst-case uncontrolled CO of 215.26 lb/hr:
215.26 lb/hr ÷ 738.1 MMBtu/hr = 0.291 lb/MMBtu.
Control Efficiency = 90% (catalytic oxidizer)
Calculation: (3400 hrs) * (738.1 MMBtu/hr) * (0.291 lb/MMBtu) * (0.0005 tons/lb) * (1-90/100) = 36.51 tons

VOC Emissions

Emission factor derived based on the GE-reported worst-case uncontrolled VOC of 13.28 lb/hr:
13.28 lb/hr ÷ 738.1 MMBtu/hr = 0.018 lb/MMBtu.
Control Efficiency = 90% (catalytic oxidizer)
Calculation: (3400 hrs) * (738.1 MMBtu/hr) * (0.018 lb/MMBtu) * (0.0005 tons/lb) * (1-90/100) = 2.26 tons

SO_2 Emissions

Note: Potential maximum SO_2 emissions for the turbine were calculated using a mass balance approach that assumed maximum allowable amount of sulfur in pipeline quality natural gas and complete transformation and emission as SO_2.

Assumptions/Constants:
0.5 gr sulfur / 100 scf (40 CFR 72.2 definition for "pipeline quality natural gas").
738.1 MMBtu/hr, LHV, design basis fuel flow per GE.
959 Btu/scf, LHV, natural gas content per GE.
32 lb/lb-mol S
64 lb/lb-mol SO2

Emission rate using mass balance: (738.1 MMBtu/hr) * (10^6 Btu / MMBtu) * (1/959 Btu/scf) * (0.5 gr S / 100 scf) * (lb / 7000 gr) * (64 lb/lb-mol SO2 / 32 lb/lb-mol S) = 1.10 lb SO2 / hr
Emission Factor: (1.10 lb SO2 / hr) * (1 / 738.1 MMBtu/hr) = 0.00149 lb SO2/MMBtu
Calculation: (3400 hrs) * (738.1 MMBtu/hr) * (0.00149 lb/MMBtu) * (0.0005 tons/lb) = 1.87 tons

Haul Roads

Vehicle Miles Traveled (VMT) per Day = 5 VMT/day (Estimate)
VMT per hour = (5 VMT/day) * (day/24 hr) = 0.21 VMT/hr
Hours of Operation = 3,400 hours

PM Emissions:

Predictive equation for emission factor for unpaved roads at industrial sites per AP 42, Ch. 13.2.2, 11/06.
Emission Factor = $k * (s / 12)^a * (W / 3)^b$ = 14.13 lb/VMT
Where: k = constant = 4.9 lb/VMT (Value for PM_{30}/TSP, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 8.5 % (Mean value for construction sites, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)

a = constant = 0.7 (Value for PM_{30}/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM_{30}/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (3400 hours) * (0.21 VMT/hr) * (14.13 lb/VMT) * (ton/2000 lb) * (1-50/100) = 2.50 tons

PM10 Emissions:

Predictive equation for emission factor for unpaved roads at industrial sites per AP 42, Ch. 13.2.2, 11/06.
Emission Factor = $k * (s / 12)^a * (W / 3)^b$ = 4.04 lb/VMT
Where: k = constant = 1.5 lb/VMT (Value for PM_{10}, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 8.5 % (Mean value for construction sites, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)
a = constant = 0.9 (Value for PM_{10}, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM_{10}, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (3400 hours) * (0.21 VMT/hr) * (4.04 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.72 tons

V. Existing Air Quality

The proposed turbine generator facility will be located approximately 7.2 miles northeast of Culbertson, Montana, about 16 miles due west of the Montana-North Dakota border. The legal description is Section 5, Township 28 North, Range 57 East, Roosevelt County, Montana. The air quality of this area is classified as either "better than national standards" or unclassifiable/attainment with respect to National Ambient Air Quality Standards (NAAQS) for all criteria pollutants. The closest Prevention of Significant Deterioration (PSD) Class I areas are the Fort Peck Indian Reservation (FPIR) at approximately 10.8 miles away minimum distance, and the Medicine Lake Wilderness Area (MLWA) at approximately 14.5 miles away minimum distance. The next closest Class I area is the UL Bend Wilderness Area at approximately 88 miles to the southwest.

VI. Ambient Air Impact Analysis

As part of Permit Application #4256-00, Basin Electric submitted a modeling analysis of ambient air quality dispersion. Bison Engineering, Inc. (Bison) provided the modeling demonstrations on behalf of Basin Electric. The analysis demonstrated compliance with Montana Ambient Air Quality Standards (MAAQS), NAAQS, and PSD Class II and Class I increments. Note that the facility is not subject to PSD rules and is not technically required to demonstrate compliance with PSD increments.

A. Project Summary

Emissions from the Basin Electric facility were calculated for the following pollutants: NOx, CO, SO_2, VOCs, lead (Pb), beryllium (Be), fluoride (F), mercury (Hg), PM_{10}, and $PM_{2.5}$. The generating unit is limited in operation to 3,400 hours per year. The calculations of the pollutant emission rates were based on a 738.1 MMBtu/hr design heat input capacity for General Electric LMS 100 model turbine. Table 1 lists potential emission rates. Note that the rates reflect intrinsic NOx control via water injection, and post-combustion control of CO and VOCs via catalytic oxidation. Bold values in the shaded cells highlight exceedances of the modeling thresholds.

Table 1. GE LMS100 Potential Emission Rates (including enforceable controls).

Pollutant	Emission Factor (lb/MMBtu)	Pounds Per Hour (lb/hr)	Emission Rate			
			Pounds Per Day (lb/day)		Tons Per Year (tpy)	
		GE LMS100	Modeling Threshold	GE LMS100	Modeling Threshold	GE LMS100
NOx	0.1064	78.5	**548**	**1885**	**100**	**133.5**
SO_2	0.00149	1.10	274	26.4	50	1.9
CO	0.0291	21.5	548	515	100	36.5
$PM_{10}/PM_{2.5}$[1]	0.008	6.00	274/**63.9**	**144**	50/12	10.2
VOC	0.00018	1.33	548	31.9	100	2.3
Pb	4.90E-07	0.0004	27.3	0.0096	5	< 0.0001
Be	1.18E-08	< 0.0001	NA[2]	NA	NA	NA
F	2.75E-09	< 0.0001	NA	NA	NA	NA
Hg	2.55E-07	0.0002	NA	NA	NA	NA

1. Rates for PM_{10} and $PM_{2.5}$ reflect filterable plus condensable particulates.
2. NA = Not Applicable.

As shown in the table, $PM_{2.5}$ (short-term) and NOx exceeded modeling thresholds. Note that the VOC rate of 0.0018 lb/MMBtu was incorrectly reported in the permit application Table 3-1 as 0.010 lb/MMBtu, and the SO_2 rate of 26.4 lb/day was incorrectly reported in the permit application Table 6-2 as 10.4 lb/day. In addition, the permit application reported lead, fluoride, and the hazardous air pollutant emission rates in pounds per million standard cubic feet (lb/10^6 scf), which were directly taken from the EPA AP-42 reference source and not corrected to lb/MMBtu by dividing the values by 1,020 for conversion as per the AP-42 footnotes (AP-42, Table 1.4-2, 7/98). The Department used the corrected rates shown in Table 1 for dispersion modeling.

The proposed facility will be located about 7.2 miles (11.6 kilometers – km) NE of Culbertson, Montana, 16 miles (26 km) west of the Montana – North Dakota border, and 55 miles (89 km) south of Montana – Canadian border. According to the permit application, this station will be located on a 15-acre parcel in the NW ¼ of the NW ¼ of Section 5 in Township 28 North, and Range 57 East in Roosevelt County. The Department calculated the facility encompassed about 15.8 acres based on the modeling files. The approximate UTM coordinates are Zone 13, 545,239 meters Easting (mE) and 5,339,872 meters Northing (mN) (Universal Transverse Mercator North American Datum 1927). The site elevation is about 2,251 feet (686 meters – m) above sea level. The air quality classification of Roosevelt County is "Unclassifiable/Attainment" for all air quality criteria pollutants (40 CFR 81.327). The closest Prevention of Significant Deterioration (PSD) Class I areas are Fort Peck Indian Reservation (non-mandatory Class I) and Medicine Lake Wilderness Area (federal mandatory Class I). These areas are approximately 10.8 miles (17.4 km) and 14.5 miles (23.3 km), respectively, from the CGS.

B. Review of Model Inputs

Bison followed the U.S. EPA *Guideline on Air Quality Models* (40 CFR Part 51, Appendix W, 11/2005) and the *State of Montana Modeling Guideline for Air Quality Permit Applications – Draft* (11/2007).

AERMOD Modeling System: The BREEZE AERMOD PRIME version 6.1 software from Trinity Consultants was used. The AERMOD modeling system included AERMOD PRIME (version 07026), AERMET (version 06341), and AERMAP (version 06341). The AERMOD modeling system was used in the regulatory default mode. No wet or dry depletion was assumed.

Terrain: Bison used plant lay-out to determine elevations of the source and buildings, which is not the recommended Department technique. When checked by the Department using AERMAP, the elevations were not significantly different. The receptor elevations and hill heights were determined from USGS 7.5 minute (1:24,000 scale) North American Datum 1927 (NAD 1927) digital elevation model (DEM) files that were imported into AERMAP. All of these files had 30 meter resolution square grid resolution.

Land Use: All of Montana is classified as rural by the Department so the rural dispersion coefficients were selected.

Receptors: According to the permit application, a total of 2,783 receptors were used in four different receptor sets. However, only 2,709 receptors were listed in the AERMOD input files. The actual number of receptors used in the AERMOD modeling is noted in parenthesis in the following discussion.

As stated in the permit application, the first Cartesian set had 100 meter (m) receptor spacings in the east-west and north-south directions centered on the turbine stack location. This grid extended out to 1 km for a total of 441 (377) receptors. The second Cartesian set used 250 m spacings with 25 receptors in the east-west and north-south directions centered on the turbine stack location. This grid extended out to 3 km and had 625 (616) receptors. The third Cartesian receptor set had 500 m receptor spacings with 41 receptors in the east-west and north-south directions that extended out to 10 km centered on the turbine stack location. This set had 1,681 (1,680) receptors. There were 36 discrete receptors outlining the facility boundary at 100 m intervals.

It should be noted that the Cartesian receptor sets that Bison developed did not follow the Department draft modeling guidelines. The modeled receptor sets were centered on the turbine stack location rather than referenced according to the locations of the facility fenceline. Therefore, the first receptor set extended in the north and west directions to about 650 m from their corresponding fenceline boundaries and approximately 550 m in the east and south directions from their respective fencelines. The second receptor set extended to about 2.6 km in contrast to the recommended 3 km in each direction from the fenceline. The third receptor set extended to about 9.6 km rather the suggested 10 km from the fenceline. Fortunately, all of the maximum NOx and $PM_{2.5}$ concentrations, regardless of the averaging period, occurred near the facility so these deviations from the Department modeling guidelines were not important.

Meteorology: Five years of meteorological (met) data (2001-2005) were used. The surface met data were obtained from Williston, North Dakota (World Meteorological Organization—WMO, station #72767) and Glasgow, Montana (WBAN station #94008, National Climatic Data Center) represented the upper air data. The anemometer height at the Williston met site was 6.1 m.

AERSURFACE: The Bison used AERSURFACE (version 08009) to develop the surface characteristics for the Williston met station for input into AERMET. The USGS National Land Cover Data 1992 archives were used to determine the land cover types for this met station. Seasonal surface characteristics were determined for 36 ten-degree sectors.

Building Downwash: The EPA-developed Building Profile Input Program – Plume Rise Model Enhancement (BPIP-PRIME) included with the BREEZE AERMOD platform was applied for building downwash. There were nine (9) buildings processed by this program.

Combustion Turbine Stack Parameters: The one point source, the turbine combustion stack, was modeled using the parameters in the Table 2.

Table 2. CGS Turbine Stack Parameters.

Stack Parameter	Value
UTM NAD 27 Zone 13 (meters Easting—mE)[1]	545,239.18
UTM NAD 27 Zone 13 (meters Northing—mN)	5,339,872.59
Elevation (meters—m)	685.84
Stack Height (m)	26.09
Stack Diameter (m)	3.5052
Stack Gas Exit Temperature (Kelvin)	695.372
Stack Gas Exit Velocity (meters per second—m/s)	14.60

1. UTM NAD 27 = Universal Transverse Mercator North American Datum 1927.

Combustion Turbine Emission Rates: Since there will be only one source, the model was executed with an emission rates of 1 lb/hr in grams per second (0.1259979 g/s), then the results were scaled to the NOx and $PM_{2.5}$ pollutant emission rates (lb/hr) given in Table 1 to arrive at the final modeled concentrations for comparison to relevant modeling criterions.

C. Class II Significant Impact Analysis

Table 3 lists the Class II modeling significance impact levels and the corresponding NOx and $PM_{2.5}$ AERMOD modeled results. There are no $PM_{2.5}$ significance levels established by rule so the values in this table are recommended in the Department draft modeling guidelines. Also included are the relevant significant impact areas (SIA). As shown, none of the significant impact levels were exceeded so no SIA were identified.

Table 3. Class II Air Quality Significance Levels and SIA AERMOD Results.

Pollutant	Averaging Period	Class II Significance Level ($\mu g/m^3$) [1]	H1H [2] Concentration ($\mu g/m^3$)	Percent of Sig. Level (%)	Date	UTM NAD 27 [3] Zone 13 (mE)	UTM NAD 27 [3] Zone 13 (mN)	Elevation (km) [4]	Significant Impact Area (km)
NOx	Annual	1	0.17	17.0	2002	545,739.19	5,339,622.59	701.00	Insignificant
$PM_{2.5}$	24-Hour	1.2	0.77	64.2	3102724 (YR,MO,DAY,HR)	545,602.62	5,339,434.10	689.23	Insignificant
	Annual	0.3	0.01	3.3	2002	545,739.19	5,339,622.59	701.00	Insignificant

1. $\mu g/m^3$ = micrograms per cubic meter.
2. H1H = High First High modeled concentration.
3. UTM = Universal Transverse Mercator North American Datum 1927.
4. km = kilometer.

Both high first high (H1H) annual NOx and $PM_{2.5}$ concentrations were located just outside the fenceline east and south of the facility, respectively. The H1H 24-hour $PM_{2.5}$ concentration occurred on the fenceline just west of the southeast corner. Since no Class II modeling significance level was exceeded, no further modeling analysis was necessary. It should be noted that Bison erroneously listed the year 2004 in the permit application as the year the highest first high 24-hour $PM_{2.5}$ concentration occurred.

D. Class I Significant Impact Analysis

The Basin Electric facility will be located relatively close to two Class I areas: Medicine Lake Wilderness Area (federal mandatory Class I area) and Fort Peck Indian Reservation (non-mandatory Class I area). Bison examined the annual average NOx impacts on these two special areas since the peak modeled annual NOx concentration was 0.17 $\mu g/m^3$, which is greater than the Class I significance level of 0.1 $\mu g/m^3$. The 0.1 $\mu g/m^3$ annual NOx isopleth was well over 15 km away from either Class I area.

Bison did not investigate either the 24-hour or annual $PM_{2.5}$ impacts on the Class I areas although they documented the recommended Department Class I $PM_{2.5}$ significance levels in the permit application. The rationale was that EPA has not established any Class I $PM_{2.5}$ significance level by rule. Therefore, the Department used AERMOD to determine the potential impacts of the 24-hour and annual $PM_{2.5}$ emissions on the two Class I areas using the Department default significance levels values of 0.07 and 0.06 $\mu g/m^3$, respectively. The results were significantly lower than either level at both Class I areas.

E. Summary

The emissions from the Basin Electric facility will not violate any NAAQS/MAAQS or impact any Class I area. The only emissions that exceeded the modeling thresholds were NOx and $PM_{2.5}$. Neither of these criteria pollutant exceeded the Class II significance levels.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

YES	NO	
X		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	X	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	X	3. Does the action deny a fundamental attribute of ownership? (e.g., right to exclude others, disposal of property)
	X	4. Does the action deprive the owner of all economically viable uses of the property?
	X	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	X	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	X	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	X	7a. Is the impact of government action direct, peculiar, and significant?
	X	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	X	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	X	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

DRAFT ENVIRONMENTAL ASSESSMENT (EA)

Issued To: Basin Electric Power Cooperative – Culbertson Generation Station

Air Quality Permit Number: 4256-00

Preliminary Determination Issued: December 16, 2008
Department Decision Issued:
Permit Final:

1. *Legal Description of Site*: Section 5, Township 28 North, Range 57 East, Roosevelt County, Montana.

2. *Description of Project*: The proposed action is to issue a Montana Air Quality Permit #4256-00 allowing the construction and operation of a plant in Roosevelt County, Montana. The proposed Culbertson East Side Peaking Project (Project) includes three primary components:

   The first component – a power generation facility with a natural gas-fired combustion turbine generator (CTG) – would be constructed to provide peaking capacity to Basin Electric's power portfolio. The Project design was based on use of a General Electric LMS100 high efficiency, simple cycle gas turbine. The CTG would have a nominal power output capacity rating of 100 MW and would normally operate between 50 and 100 percent of rated capacity. Operation of the facility would be limited to no more than 3,400 hours per any twelve-month period. The CTG facility would occupy a fenced area of approximately 15 acres.

   Natural gas would be provided by the Northern Border Pipeline Company (NBPC) from an existing gas line that passes through the 165 acre parcel of land upon which the CTG facility would be located. NBPC also owns and operates an existing natural gas compressor station on property adjacent to the proposed CTG facility. Approximately 100 gallons per minute (gpm) of water would be required for operation and maintenance of the CTG. This would be provided by Dry Prairie Rural Water Authority from an existing water pipeline approximately three miles north of the proposed CTG facility.

   Air emissions from the facility would consist of combustion gases from the CTG. Two underground collection tanks would collect oily water resulting from cleaning and maintenance of the CTG and ancillary equipment. Contaminated water from these tanks would be pumped and transported to a licensed commercial waste disposal facility. An evaporation-type holding pond would be constructed within the CTG facility boundary to hold storm water runoff and non-contact cooling water. Sanitary waste water would be disposed in an on-site septic system. No hazardous wastes would be produced by the generation process.

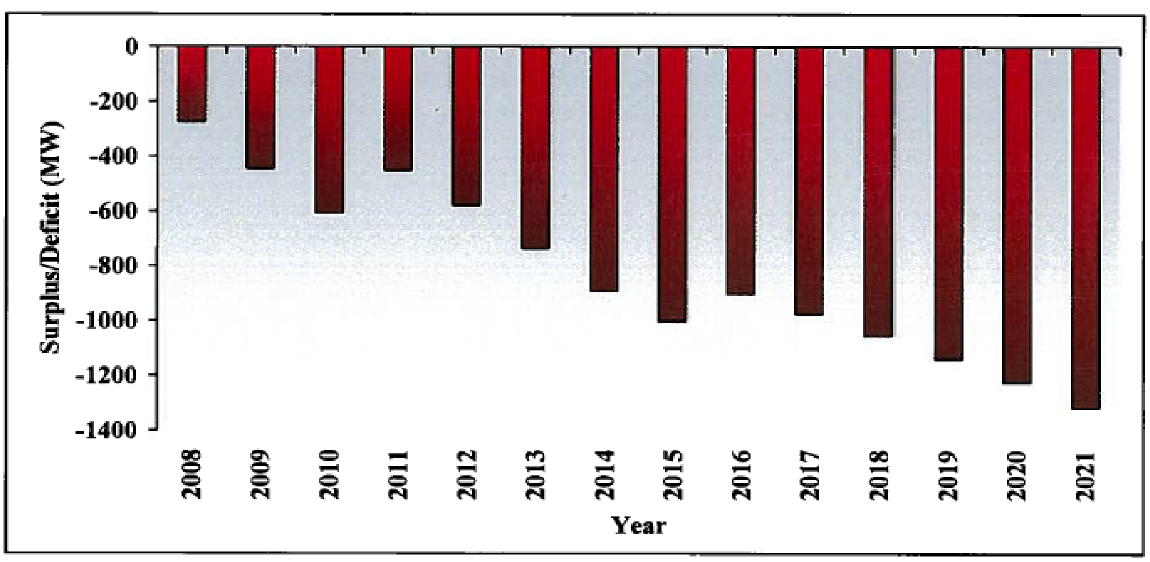
   The second component – a 115 kV transmission line (Transmission Line) – would deliver power from the CTG to a client transmission grid. This line would conform to existing standards for 230 kV transmission design to allow for planned future upgrades to client systems. The Transmission Line would occupy a 125-foot right of way with a linear length of approximately 4.5 miles.

The third component – a 115 kV transmission interconnection substation (Substation) – would be constructed to facilitate connection to the existing Western Area Power Administration (Western) Williston-to-Wolf Point transmission line. The Substation would occupy an area of less than 15 acres and be located on a parcel of land that would be owned and operated by Western.

3. *Objectives of Project*: Basin Electric has established the need for additional peaking capacity to service forecasted member load growth in northeast Montana and northwest North Dakota. This expected load growth is due to increased oilfield-related activities as well as continued heavy electrical usage during summer months. Following is a summary of a Basin Electric analysis of current and projected demand and supplies within the Project region. The full analysis report is entitled "Culbertson Combustion Turbine Alternative Evaluation Analysis and Site Selection Study".

Between 1999 and 2006, Basin Electric system peak demand increased 752 MW from 1,195 to 1,947 MW or approximately 107 MW per year. During that same period, Basin Electric system energy sales increased by 5.3 million MWh (from 6.5 million MWh to 11.8 million MWh) or approximately 760,000 MWh per year. Basin Electric forecasts peak demand on its system to grow by 1,834 MW from 2006 through 2021 or approximately 122 MW per year. Basin Electric forecasts energy consumption on its system to grow by approximately 12 million MWh from 2006 through 2021 or approximately 800,000 MWh per year. The average expected increase in energy sales compared to the average expected increase in peak demand results in a 75% annual load factor for the forecasted load growth. Demand is forecasted to double in the next 15 years, with 1,947 MW in 2006 projected to grow 1,834 MW by 2021, and 2006 energy usage at 11.8 million MWh forecasted to grow 12 million MWh by 2021. The load growth is driven mainly by commercial sector growth which includes energy related development in the form of coal, oil and gas development and also increased loads in the residential sector mainly located on the outskirts of larger cities within the service territory.

The difference in the load forecast plus other obligations (such as sales, losses, and reserves less Basin Electric's system-wide load management) and existing and planned generating resources along with purchases, defines the load capacity of the Basin Electric system which shows the amount of surplus capacity of the system. The figure below shows Basin Electric's total system summer season power deficit capacity.



Basin Electric's total system deficit is 275 MW in 2008 and is forecasted to increase steadily over time. The two periods that do not produce additional deficits from one year to the next are when the Dry Fork Station in Wyoming is anticipated to go commercial in 2011 and when a long-term power supply obligation ends in early 2016.

Construction of the Culbertson Power Generation Project is required to meet the growing power consumption needs of Basin Electric's customers in its service territory. The additional capacity requirement is driven by anticipated general member load growth, including commercial load growth, throughout the Basin Electric member service area. Basin Electric will have a power deficit in 2008 that will require additional power peaking resources. Analyses of loads and resources in the affected service area showed that 80-100 MW extra capacity, specifically load peaking capacity, was required during the summer air conditioning season.

4. *Alternatives Considered*: Basin Electric has conducted a study of alternative approaches to satisfying unmet demand for electrical power among its cooperative members in the northeastern Montana and northwestern North Dakota region. The analysis is entitled "Culbertson Combustion Turbine Alternative Evaluation Analysis and Site Selection Study" (Alternative Analysis). A number of demand-side and supply-side resource alternatives were considered as a means of meeting the forecasted electrical need for Basin Electric. The alternatives evaluated included demand-side management, renewable energy sources, traditional energy sources, nuclear power, repowering/uprating existing generation units, purchasing power from another supplier, and developing new transmission capacity.

   Before selecting an alternative to meeting forecasted energy demand growth, Basin Electric narrowed the scope of the study to demand for peaking capacity. This class of power supply is called on during peak daily and seasonal demand periods. It requires the capability of economically starting up and shutting down within a relatively short period of time. The study concluded that the optimum, least-cost resource option to satisfy future peaking requirements would be a 100 MW simple-cycle, natural gas-fired combustion turbine.

   The alternatives study also evaluated alternative locations for a new power generation facility. Two sites were originally considered for the project. Both sites are located along the Northern Border Pipeline thus ensuring a reliable fuel source is available. Site 1, near NBPC Compressor Station Number 3, is located approximately 7 miles northeast of Culbertson, Montana in the northwest corner of Section 5, Township 28 North, Range 57 East, of Roosevelt County. Site 2, near NBPC Compressor Station Number 2, is located approximately 23 miles northeast of Wolf Point, Montana on the Fort Peck Reservation in the northwest corner of Section 30, Township 31 North, Range 48 East, of Roosevelt County. Firm gas supply and transportation agreements are in place with Northern Border Pipeline that meet Mid-Continent Area Power Pool accreditation requirements. The compressor station locations are also favorable because of existing above-ground pipeline taps. Since both sites are adjacent to the NBPC, neither site has an advantage over the other with respect to fuel supply.

   The terrain in the Site 1 study area is relatively flat with some rolling hills to the south. The area surrounding the site is well-drained. The area under consideration for Site 1 is agricultural, consisting primarily of farming and ranch land. The elevation of the Site 1 is approximately 2250 feet above mean sea level. The terrain around the Site 2 study area is interspersed with agricultural lands and significant drainage features. The elevation of Site 2 is approximately 2680 feet above mean sea level. Due to increased presence of pronounced drainage formations surrounding the Site 2 area, Site 1 would likely pose fewer challenges in terms of establishing a transmission corridor between the proposed peaking station site and the existing 115 kV Transmission system owned by Western.

The proposed combustion turbine, a General Electric LMS 100, would use water injection to control NO_x emissions and for evaporative cooling. Based on a review of the manufacturer's literature, the turbine would require a maximum of 105 gallons of treated water per minute. Site 1 is located less than three miles south of an 8" header tie-in point to the existing Dry Prairie Rural Water distribution system. There is currently no rural water distribution system available in the Site 2 area; therefore, Site 2 would have to be serviced from a groundwater source. Currently, location of an abundant groundwater source in the Site 2 region remains undetermined, and several test wells would have to be drilled in the region to locate a source capable of delivering water with the quality and flow rate required. Because of uncertainties associated with water supply in the Site 2 region, Site 1 offers advantages in that a known and established water distribution system consisting of adequate supply and quality is readily available less than three miles from the proposed site.

Site 1 is located approximately 3.5 miles north of the existing Western 115 kV Williston-to-Wolf Point transmission line. The transmission line has existing capacity to accept additional power from the Project, and Western is planning to upgrade the line to 230 kV standards. Site 2 is located approximately 18 miles from the nearest high voltage transmission facilities. The shorter transmission line associated with Site 1 would cause less land to be disturbed by construction activities and would also be less costly to construct since fewer materials and less labor would be required. As such, Site 1 has a significant advantage over Site 2 since it is much closer to the high voltage transmission system.

Based on the evaluation criteria applied in the site selection process (i.e., access to a high voltage transmission system with available capacity, fuel supply, water supply, and favorable existing land use and terrain), Site 1 offers considerable advantages versus Site 2. The relatively short distances to a treated water supply and to high voltage transmission facilities at Site 1 required less disturbance of natural resources and are less costly because fewer materials and less labor would be required to complete the project. Accordingly, Site 1 was selected as the project proponent's preferred alternative. The following table summarizes the relative advantages of each site.

Alternative	Fuel Supply	Water Availability	New Transmission (approx. distance)	Terrain
Site 1	Yes	Yes/Rural Water Utility	3.5 miles	Gently rolling
Site 2	Yes	Unknown/wells	18 miles	Significant Drainage features present

Because the Alternative Analysis evaluated all practicable alternative actions and locations relative to the stated objective, and because all but one of those alternatives were eliminated due to economic and technical factors, this Environmental Assessment will consider only the single remaining action alternative (the Project). The Environmental Assessment will additionally evaluate the alternative of taking no action. The "no-action" alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because Basin Electric demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a BACT analysis, would be included in Permit #4256-00.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. *The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.*

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Aquatic and Terrestrial Life and Habitats			X			Yes
B	Water Quality, Quantity, and Distribution			X			Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity, and Quality			X			Yes
E	Aesthetics			X			Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resource of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites				X		Yes
J	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Aquatic and Terrestrial Life and Habitats

Wildlife habitat diversity in and near the Project is low, and is dominated (about 80 percent of the area) by cultivated fields re-seeded with introduced grasses and dryland hay. There are no aquatic habitats on the site. Consequently, no fish are present and wildlife species richness is comparatively low. Most species recorded during a reconnaissance of the area in late May 2008 were common in the region and were considered to be representative of the affected habitats.

Significant adverse impacts could occur relative to fish and wildlife resources if activities associated with construction or operation of the Project were to result in alteration or fragmentation of a substantial portion of regional wildlife habitat used for breeding, foraging, and refuge. Significant adverse impacts could also result if Project-related activities caused a loss of a population of individuals that would likely jeopardize the continued existence of any wildlife species in the area. Finally, significant adverse impacts would occur if the Project resulted in a violation of the Bald and Golden Eagle Protection Act.

Short-term direct impacts from construction would include mortality or displacement of individual animals at the construction sites, and loss or alteration of habitat. Since these species were common in the general area, this impact would have little significance on local populations. Long-term impacts would include alteration or removal of negligible amounts of habitat relative to the amount of habitat available in the area. Since none of the affected habitats is considered to be unique or critical to wildlife, this impact would also be considered minor.

There is a possibility for bird collisions with the Transmission Line, which would add incrementally to similar impacts throughout the region. Project-related activities would not result in intentional taking of bald or golden eagles or of any other raptors or migratory birds. The no-action alternative would not affect this resource in any way.

Habitats disturbed during construction but not needed for the life of the Project would be reclaimed soon after construction, and wildlife use of these sites would resume thereafter. Since no significant or short- or long-term impact would be expected from development of the Project, no monitoring would be needed. Overall, impacts to aquatic and terrestrial life and habitats would be minor.

B. Water Quality, Quantity and Distribution

The Project site lies in the Charlie-Little Muddy watershed. The Missouri River flows west to east and is about nine miles to the south of the site. Contributory surface water in the area of the site includes Shell Creek which flows north to south and lies roughly one-half mile to the east of the site, and an unnamed creek which also flows north to south and lies roughly one to two miles west of the site. Both creeks empty into Clover Creek which flows west and joins the Missouri near Culbertson. Flow data are not available for either Shell Creek or the unnamed creek, but both are mapped as ephemeral.

Groundwater conditions beneath the site are described in literature references and interpreted from existing well information. The Groundwater Information Center (GWIC) database, maintained by the Montana Bureau of Mines and Geology (MBMG), was queried for wells in the area of the site. A total of 96 wells was found in all of T28N R57E. The wells in the database include 20 domestic and 37 stockwater wells. The remaining wells include 25 monitoring wells, 11 that are unused, 2 listed as other, and 1 unknown.

Aquifers in the area include coarser grained zones in the glacial deposits and the Fort Union Formation that are under confined conditions. Well logs found in the well search with aquifer designations include 11 designated as Fort Union, 6 as Pleistocene Glacial Outwash, 2 as Glacial Drift, and 1 as Quaternary Alluvium. However, upon reviewing logs with associated lithology, it is apparent that the majority of the wells in the area are completed in the Fort Union Formation. A review of water level and well construction data indicates that the water-bearing zones exploited by wells in the area are all confined.

Overall depths of wells in the area average 68 feet, with the deepest being 280 feet. Static water levels range from 19 to 167 feet, with an average of 73 feet. Yields average 57 gpm, with a maximum of 800 gpm, although this high yield is in glacial drift and appears anomalous.

Groundwater contours were developed from water level data from 22 wells in the area. The contours show that groundwater flows to the south at a gradient of roughly 0.012. Using the average hydraulic conductivity of 217 ft/d obtained from the specific capacity data, this equates to a groundwater velocity of 13 ft/d.

In general, the groundwater beneath the site is poor in quality. Water quality data were obtained from two wells to the south of the site completed in the unconsolidated material, and from three wells to the east and west of the site completed in the Fort Union Formation. The data show that the unconsolidated and Fort Union groundwater have similar water quality. Water is high in total dissolved solids (TDS), sodium, and sulfate. Drinking water standards are exceeded in multiple samples for sodium and sulfate (secondary maximum contaminant levels (SMCL)), although the levels are below the standard for stockwater.

Following is an assessment of adverse effects that could result from the Project on water quality within the surrounding watershed. Significant adverse effects to water quality could occur if operation of Project facilities caused an exceedance of acceptable contaminant levels in surrounding surface or ground waters. Significant adverse effects could also occur if quantities of water are withdrawn from surface sources or local aquifers that restrict existing or planned uses.

Approximately 100 gpm of water would be required for air pollution control and cooling of the CTG. This and ancillary demand would be provided from existing supplies managed by Dry Prairie Rural Water Authority, a local rural utility. No water supplies in the area would be impacted by the Project.

No process-related discharges are expected from the power plant. Any water that may come in contact with process equipment and that is not maintained within the turbine system, such as water used for maintenance or drained from the cooling system, would be collected in underground collection tanks. These tanks would be periodically pumped to trucks for off-site treatment and discharge by a licensed facility. Sanitary waste from the facility would be directed to an onsite septic system which would not adversely impact shallow groundwater or surface water.

Storm water from the CTG facility and Substation could possibly become contaminated with oils and chemicals from contact with exposed equipment and then contaminate surrounding surface or ground waters. Further, storm water collected from impermeable surfaces at both locations could potentially cause erosion of surrounding areas and deposit elevated levels of sediment to surface waters. The potential level of these impacts is slight due to the limited area of impermeable surface associated with the CTG facility and the Substation. In addition, surrounding fields are well-vegetated with native grasses. Surface soils in the area are naturally permeable, and slopes are generally moderate (approximately two to eight percent). Potential adverse effects from storm water runoff at the CTG facility and Substation sites would further be mitigated as described below. These natural and designed mitigation measures and effects combine to make impacts of storm water runoff from the CTG and Substation sites minor.

During the construction phase of the CTG and Transmission Line, earth movement and excavation would take place, and heavy machinery would be operated on site. Soil disturbance from construction activities can contribute to soil erosion leading to increased sediment inputs to Shell Creek, the unnamed creek to the west of the site, and other minor creeks. To a lesser degree, oil and grease and other constituents can be present in the storm water runoff from the construction site. Potential adverse effects resulting from storm water runoff resulting from construction activities would be minor due to natural mitigation effects described above and designed mitigation measures described in the next section. Post-construction storm water runoff impacts associated with transmission lines and structures are expected to be negligible due to the limited and dispersed area of disturbance.

The CTG plant would obtain water for potable use and operating purposes by pipe from the Dry Prairie Rural Water Authority distribution system. Because groundwater is not being used as a source, there would not be any impact to surrounding wells from the power plant.

Collection tanks for waste water that contacts process equipment may leak or rupture, and the infiltration of these products into the subsurface could adversely impact groundwater quality. Potential adverse impacts to groundwater from underground waste water collection would be minor due to designed mitigation and monitoring measures described in the next section.
The no-action alternative would not affect regional or local water quality in any way.

Although no storm water discharge permit for industrial activities is categorically required for either the CTG facility or Substation site, Basin Electric would employ best management practices to reduce adverse effects from storm water runoff. These practices would include construction and operation of a storm water collection and evaporation pond at the CTG facility and replacement of disturbed ground cover where possible.

The potential for impacts from collection tank leaks would be reduced by using new tanks designed to current industry standards and by employing suitable best design and management practices. These practices would include double wall, fiberglass construction and installation and operation of a leak detection monitoring system.

Because the area of disturbed ground for the total Project would exceed one acre, Basin Electric would be required to conduct construction activities within the requirements of a Montana Pollutant Discharge Elimination System (MPDES) permit for storm water discharges associated with construction activities. This permit would require development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that includes implementation of best management practices and a monitoring program. Basin Electric would also use best management practices during all phases of construction to limit soil erosion and contamination of surface waters. Disturbed areas would be reseeded with a certified weed free seed mixture recommended by the local USDA Natural Resources Conservation Service (NRCS) and returned to natural or near-natural conditions where possible.

C. Geology and Soil Quality, Stability and Moisture

Significant adverse impacts to regional geology and soils could occur if construction or operation of the Project substantially altered the geography or topography of the area, or if resultant soil erosion caused measurable sediment increases in surrounding surface water or caused widespread soil compaction that interfered with plant growth. No activities associated with construction or operation of the Project would in any way affect geology or topography in the area.

The site lies on the margin between the glaciated and unglaciated Missouri Plateau sub-province in the physiographic region known as the Interior Plains Province. The highest and oldest area consists of remnants of the Flaxville plain in the northern part, with several meltwater channels incised into these remnants. One small driftless area is at the northern edge. A 3-mile-wide belt of pre-Pleistocene and Pleistocene Wiota gravel deposits, ice marginal channels, and ice marginal till ridges border the Flaxville gravel remnants on the south and east. To the south and at a lower altitude there is a belt of gently rolling ground moraine. South of this, and extending to the edge of the alluvial flat, is a four to seven mile wide belt of partially dissected ground moraine plain characterized by a conjugate system of till ridges oriented northwest-southeast and northeast-southwest. The Missouri River floodplain is a 3-mile-wide belt just north of the steep cliffs comprising the south valley wall of the Missouri River.

The site lies on the western flank of the Williston basin. Regional dip of the basin averages 25 ft/mi to the northeast with the Poplar anticline lying to the west (Spencer, 1980). The uppermost bedrock in the area is the upper Paleocene Tongue River Member of the Fort Union Formation. Fort Union sediments were deposited during the Paleocene as the Big Horn Mountains and Black Hills began to rise with the Laramide orogeny, and large volumes of sediment were transported into the swampy flood plain environments (BLM, 2004). Continental conditions prevailed with abundant accumulation of organic material in swamps. Deposition was cyclic in nature and generally represented a period of alternating fluvial and lacustrine conditions.

The Fort Union Formation of the early Tertiary Period, Paleocene Epoch contains variable floodplain sediments deposited in an area of low relief with an abundance of ponds and swamps. Sandy beds are river channel deposits and finer textured beds are floodplain and levee deposits with coal forming in swampy areas. This formation is more than 2,000 feet thick and is divided into three members, a basal member known as the Tullock, followed by the Lebo, and an upper member called the Tongue River. The Tullock and Tongue River Members are very similar in composition except that the Tongue River contains thicker, greater number, and more persistent coal seams and clinker beds (BLM, 2004).

The Tongue River Member is the thickest of the Fort Union members and consists of soft interbedded light yellow to light gray fine to medium grained, thick bedded to massive locally crossbedded lenticular sandstones, and siltstone. It commonly contains light buff to light gray shale, siltstone, brown to black carbonaceous shale, coal seams, and clinker beds. Most sandstones are soft and weakly cemented by calcium carbonate, some sandstones are more resistant, capping buttes and ridges in dissected areas. Shallow coal seams have been extensively burned in the Tongue River Member, baking the overlying sediments into reddish clinker. Because of the resistance of clinker to erosion, these areas show more relief and tend to develop rugged topography. Most sandstone grades into siltstones and shale within short distances, though some persist laterally. Gypsum crystals and powdery sulfur are found along bedding planes in some carbonaceous shale (BLM, 2004).

Soils at the Project location were inventoried by the NRCS as part of the 1985 Soil Survey of Roosevelt and Daniels Counties, Montana (USDA 1985). Soils at the CTG site are identified as the *Williams-Zahill loams 2-8% slopes*. These soils are formed in glacial till and have a loam surface soil and clay loam subsoil. Soils at the Substation are identified as the *Farland-Cherry silt loams 2-8% slope*s and the *Cabba-Cambert-Cherry silt loams 8-15% slopes*. All of these soils formed in weakly consolidated sedimentary beds (shale, siltstone and sandstone). The Cabba and Cambert soils have silt loam surface soils with weakly consolidated sedimentary beds at 18-30 inches depth. The Cherry soils have silt loam surface and subsoils. The Farland soils have silt loam surface soils and clay loam subsoils. None of these soils is rated as having severe limitations for shallow excavations or other activities that may occur in relation to the Project.

Prime farmland soils, as defined by the NRCS, are soils that are best suited to producing food, feed, forage, or fiber crops. The NRCS recognizes the importance and vulnerability of prime farmlands throughout the nation and encourages the wise use and conservation of these soils where possible. No prime farmland soils are present within the Project area.

Potential impacts to soils may result from construction activities for buildings, roads, pipelines, power lines, staging areas, borrow sites or other locations where soils are disturbed. Erosion may occur where the vegetation is removed. Soil erosion potential at the CTG facility and Substation construction sites is low due to the porous nature of the surface soil and its ability to absorb water. Soil erosion potential is also low due to the gentle slopes at these sites (2-8% slopes). Soil erosion potential along the proposed power line route is moderate to high due to the steeper slopes (15-45% slopes). However, soil disturbances for power line construction are limited to small, discontinuous sites (individual power poles or tower footings) and are widely-spaced across the landscape. The greatest potential for soil erosion related to this Project is from temporary and permanent road construction and vehicle use. The potential for and effects related to soil erosion would largely be temporary and very limited in scope. Mitigation measures described in the next subsection would further limit potential soil erosion effects.

Surface soil compaction in areas to be revegetated may occur where heavy equipment or other vehicles are used, especially when soils are moist. Soil compaction effects would be minimized by limiting vehicle use. Vehicles would be restricted to established travel and construction routes and to periods when the soil is dry. If any reclaim areas become compacted, they would be treated by ripping, plowing, disking or other appropriate methods prior to re-vegetating.

Basin Electric would need to obtain permit coverage under a *General Permit for Storm Water Discharges Associated with Construction Activities* from the Department, and would have to develop a *Storm Water Pollution Prevention Plan* (SWPPP) for this Project. These documents would provide details of all potential disturbances and the appropriate erosion and sediment control methods to be used to minimize effects. Regular inspections during and following construction would occur to ensure erosion control techniques are properly implemented. A plan to limit short-term erosion would include measures such as limiting the area of disturbance and the use of silt-fences, straw mulch, temporary runoff diversions, sediment basins, temporary grading and other methods. Long-term erosion would be effectively minimized by re-grading and re-vegetating as quickly as possible following disturbance. Soil erosion on temporary and permanent roads would be minimized by proper drainage with dips, waterbars or other methods to prevent water from concentrating on roadways. Additional roadway erosion controls may include cut and fill slope revegetation, surfacing, and restricting use during wet periods.

No significant direct, indirect, or cumulative adverse impacts to the topography or geological resources of the Project area are anticipated as a result of the Project. Construction would require the removal and/or disturbance of small amounts of near-surface materials, yet the construction would have no measurable effect on the geological features or resources of the Project area. The no-action alternative would not affect this resource in any way. Overall, there are no anticipated impacts to geology, and only minor impacts to soil quality, stability and moisture.

D. Vegetation Cover, Quantity, and Quality

Approximately 80 percent of the area examined during a reconnaissance of biological resources of the Project area, including the CTG facility and Substation sites, is comprised of cultivated fields that have been re-seeded in introduced (non-native) grasses or dryland hay. Native vegetation communities are shortgrass prairie typical of the region, but have been substantially invaded by introduced grasses, particularly in drainages. No unique or important native vegetation communities, such as riparian areas or wetlands, were identified during the reconnaissance. Comparatively few noxious weed infestations are present in the area.

Significant adverse effects to vegetation in the Project area could result from the Project if a substantial proportion of any existing unique vegetation community with identified value were to be altered or destroyed. Approximately 95 acres of dryland hay would remain out of production through the life of the Project. Approximately 90 acres of introduced grass field would be disturbed during construction of the Substation and Transmission Line, and about 25 acres would remain out of production through the life of the Project. Neither of these would be considered a significant impact in comparison to the widespread availability of these communities in the area.

Construction impacts to native shortgrass prairie would be temporary and short-term. A very small amount (less than 5 acres) of native grassland would be disturbed for the long-term by placement of transmission line structures. This loss would not be considered significant in comparison to the availability of this habitat in the area.

Soil disturbance would increase the potential for introduction of noxious weeds, and could add incrementally to the cumulative effect of noxious weed increases in the region. The no-action alternative would not affect this resource in any way.

Construction disturbances would be reclaimed shortly after construction is completed. Most areas affected by short-term disturbances would be returned to pre-disturbance conditions (introduced grasses or dryland hay) within one growing season. Any noxious weed infestations that might develop after construction would be managed in accordance with Roosevelt County or other applicable weed district requirements. Overall, impacts to vegetation cover, quantity, and quality would be minor.

E. Aesthetics

A significant visual impact would result if the Project interrupted a scenic view, was located in a distinctive or important landscape, could be observed from an important cultural resource, or if the Project was in the immediate foreground of a public viewshed.

The area surrounding the Project consists primarily of agricultural rangeland and farmland, much of which is enrolled in the USDA's Conservation Reserve Program and is not actively cultivated. The existing NBPC natural gas compressor station (No. CS-3) is located less than 300 yards northwest of the CTG facility. The compressor station takes up approximately eight acres of land.

The 125-foot wide power Transmission Line corridor heads east from the turbine station location for one mile to Lanark Road. The corridor turns south and follows the west side of Lanark Road for 3.5 miles to a curve in Lanark Road where the existing 115 kV Western power grid line is presently located. The Transmission Line corridor would run through existing agricultural land. The Substation would be located at a curve in Lanark Road and near a small, inactive quarry.

The area's original prairie landscape currently exists in an altered agricultural state. Linear features of highways, paved roads, gravel roads, railroads, electrical transmission lines, telephone lines, and fencing transect the Project area. Evidence of the NBPC underground gas pipeline transects the Project area generally southeast to northwest. Existing 115 kV electrical transmission lines run east to west adjacent to the Substation site.

The Transmission Line would run through existing agricultural land adjacent to an existing unpaved road for most of its length. The Substation would also be located near an existing county road. There is an existing quarry just south of the Substation site. Equipment, construction vehicle traffic, signs, and excavated earth would be visible from adjacent roads and would create a temporary direct impact during the construction phase of the Project. None of the Project components is directly visible from any of the surrounding residences.

The addition of the Project to the area would have no significant direct, indirect, or cumulative impacts on the area. Distinguishable features throughout the Project area generally include dispersed structures such as residences with surrounding out buildings and the NBPC compressor station buildings, roads, power lines, fields, and fencing that transect the area. The existing landscape has been modified by agricultural development in the past by. The scenic quality of the Project area is not unique, unusual, or specially designated. N o scenic drives, trails, or viewpoints exist in the Project area. Overall, visual impacts in the Project area are anticipated to be minor.

Significant adverse effects to ambient noise levels could occur if noise or noise effects from the combustion turbine or construction activities continuously or routinely exceeded generally acceptable levels at or near surrounding residences. Potential noise sources in the area include the compressor station, wind, wildlife, road traffic, and farm equipment. In general, ambient noise levels are very low. Topography in the Project study area is mostly gently rolling, open rangeland and agricultural land with scattered wild grasslands. The terrain is unlikely to have any noticeable effect on noise propagation from sources around the Project area.

Noise generally refers to sound when the sound is undesired and an irritant. The perceived loudness of audible sound is expressed as "sound pressure level" (SPL), which is a logarithmic measure of sound pressure relative to a reference value. Audible SPL is measured with a frequency-weighted scale in units of A-weighted decibels (dBA). Following are example sound pressure levels (Haywood, 2008):

• Soft whisper, 2 m distance 35 dBA
• Conversation, 1 m distance 50 dBA
• Urban area background or busy office 60 dBA
• Vacuum cleaner, 3 m distance 70 dBA
• Heavy truck, 15 m distance 85 dBA
• Jackhammer, 15 m distance 95 dBA

Noise associated with the Project would originate from construction and operation of the combustion turbine, electrical transmission line, and substation. During construction, noise could reach 85 to 105 dBA (Basin Electric, 2007) and may be experienced at nearby residences and in surrounding fields. Construction of the Project would probably increase perceived noise levels at nearby residences. Construction would be scheduled and implemented in a manner that would minimize construction noise annoyances, such as by confining noise-producing activities to daylight hours. Overall impacts from construction noise are expected to be minor due the attenuating distances between the Project locations and surrounding residences and the temporary nature of construction activities.

Operational noise impacts associated with gas turbine operation would be limited to the vicinity of the CTG facility. General Electric guarantees that the sound level created by the LMS100 turbine would not exceed 65 dBA at 400 feet distance from the source. Residences nearest to the CTG facility are located at the following approximate distances and directions from the site:

• 0.7 miles south,
• 1.1 miles west-northwest,
• 1.2 miles east-northeast, and
• 1.7 miles northeast

No residences are located within several miles of the Substation. Both the Substation and the Transmission Line (for most of its length) are adjacent to an unpaved county road.

As reported above, the closest distance between a residence and the CTG facility is 0.7 miles (3700 feet). If the turbine were creating the maximum guaranteed sound level of 65 dBA at 400 feet, the sound level at the residence would be 45.7 dBA. A useful reference for acceptable sound levels is provided by the Federal Highway Administration in their "Procedures for Abatement of Highway Traffic Noise and Construction Noise" published at 40 CFR Part 772. This guideline establishes an upper acceptable limit of 57 dBA (exterior) for highway noise impacts on "(l)ands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose."

The magnitude of audible noise above background levels during operation of the Project would be mitigated using noise abatement and control techniques. For example, the GE LMS100 series of modular power plants have built-in gas turbine exhaust "muffler systems" to significantly abate the sound that is inherent in jet engine operation. Based on the above discussion and reference comparisons, it can be concluded that sound level (noise) impacts resulting from operation of the combustion turbine would be minor.

Operational noise impacts from the hum of electrical transmission line and from the Substation are expected to be minor as they would be of relatively low intensity and local to the source.

The no-action alternative would not affect this resource in any way. No mitigation or monitoring is required to reduce aesthetic impacts.

F. Air Quality

Significant adverse effects to ambient air quality could occur if air emissions result in ground-level pollutant concentrations that exceed national and/or state standards or if the combustion turbine plant operates in a manner that does not comply with air quality permit limits and conditions.

The area in which the Project is located is classified as a PSD Class II area (40 CFR 52.1382). The Project and surrounding areas are designated as attainment or unclassifiable in accordance with 42 USC 7407 (d)(1)(A)(ii) and (iii). Accordingly, these areas have been proven or presumed to comply with NAAQS for all pollutants for which such standards have been promulgated. The Project and surrounding areas are also considered to be in compliance with all MAAQS. The nearest ambient air monitoring station is located approximately 60 miles to the southeast in Watford City, North Dakota. It measures ambient concentrations of NO_x, PM_{10}, $PM_{2.5}$, SO_2, and ozone.

The Project area consists of active and uncultivated farmland. Existing sources of air emissions are primarily fugitive in nature and include farming related activities, windblown dust from tilled farmland, and road dust from traffic on unpaved county roads. Adjacent to the CTG facility is a natural gas compressor station owned and operated by Northern Border Pipeline Company. A compressor turbine, an emergency generator, and a heater boiler – all fueled by natural gas – comprise the facility's air emission sources. Emissions from the facility are limited in accordance with Montana Air Quality Permit #2974-02.

The open, flat topography of the area facilitates effective dispersion of air pollutants and inhibits inversion conditions that would tend to concentrate pollutants. The PSD Class I areas nearest the Project site are the Fort Peck Indian Reservation (FPIR) and the Medicine Lake Wilderness Area. The CTG facility is approximately 14.5 miles south of the Medicine Lake Wilderness Area, a mandatory Federal Class I area. The nearest point on the boundary of the FPIR, which is not a mandatory Federal Class I area, is approximately 10.8 miles northwest of the CTG facility. The next closest Class I area is the Theodore Roosevelt National Park, over 60 miles from the Project.

The Project area is semi-arid, and is characterized by cold, dry winters and hot summers. Recorded temperature extremes range from -58 to +117 °F, with monthly averages ranging from -3.0 to 84.3 °F.[1] The average annual precipitation for the area is 13.2 inches, with extremes for the published 95-year period of 20.8 and 8.2 inches. More than 50% of the average annual precipitation falls during the months of May, June, and July.

[1] Medicine Lake Climate Station (245572, Medicine Lake 3 SE); data from 1911 to 2006. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?mtmedi

Construction activity air emissions would consist primarily of fugitive particulate emissions resulting from surface grading and vehicular traffic. Temporary localized emissions of gaseous combustion pollutants would also result from construction-related traffic and miscellaneous activities. All construction-related air emissions would be intermittent, of limited duration, and of low quantities with respect to air emissions that normally occur in the area. Direct, indirect, and cumulative adverse impacts on background pollutant concentrations resulting from construction-related activities would be negligible.

The only consistent, stationary source of air emissions associated with the Project would be the natural gas-fired combustion turbine. It would have the potential to emit the following regulated pollutants: NO_x, PM, PM_{10}, $PM_{2.5}$, SO_2, CO, ozone (as VOC), Pb, Be, fluorides (F), and Hg. Annualized emission rates of these pollutants are estimated as shown in the table below.[2] These estimates are based on design information provided by General Electric for the proposed turbine engine and on EPA emission factors for natural gas combustion (Basin Electric, 2008).

Pollutant	Estimated Potential Emission Rate (ton/yr)
NO_x	133.5
SO_2	1.9
CO	36.5
PM [3]	2.9
PM_{10}, and $PM_{2.5}$ [3]	10.2
VOC	2.3
Pb	<0.0001
Be	<0.0001
Fx	<0.0001
Hg	<0.0001

In addition to these pollutants, the Federal Clean Air Act specifically addresses HAPs, which is comprised of 189 individual compounds or groups of compounds. Emission rates of these pollutants are estimated to be negligible. Many of the HAPs result from incomplete combustion of organic fuel. The proposed turbine is designed to operate with a very high combustion efficiency (greater than 99 percent at full load). Further, natural gas is a relatively clean fuel in that it contains only trace amounts of contaminants that could contribute to HAP emissions.

Potential emissions of CO_2 are estimated to be approximately 147,600 tons. CO_2 is not a regulated pollutant, but it has been determined to affect the climate on a global scale. CO_2 emissions from natural gas turbines are considered to be relatively low with respect to combustion of other fuels for energy production. For comparison, CO_2 emissions from subbituminous coal are estimated to be approximately double those from natural gas. Emissions of CO_2, which is ubiquitous in the atmosphere, at the rate estimated for the combustion turbine are inconsequential locally and globally.

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[2] The rates shown assume maximum annual operation of 3400 hours. Basin Electric is proposing this limit be added to their air quality permit as an enforceable condition.

[3] It is expected that all particulate emitted from the combustion turbine will be less than 2.5 microns in diameter. Therefore, emission rates for PM_{10} and $PM_{2.5}$ are expected to be identical. Note that PM, by definition, excludes condensable particulate, whereas PM_{10} and $PM_{2.5}$ include condensable particulate. That is why estimated potential PM emissions are less than PM_{10} and $PM_{2.5}$ emissions.

Basin Electric has applied for and would need to obtain a Montana Air Quality Permit prior to commencing construction of the combustion turbine facility. They would also apply for and obtain an operating permit in accordance with Title V of the Federal Clean Air Act within the prescribed time limit after commencing facility operations.[4] Both permits would be issued by the Department with Basin Electric demonstrating compliance with ambient air pollution concentration standards. These standards have been established by the state and federal governments to "protect public health, including the health of 'sensitive' populations such as asthmatics, children, and the elderly." The standards are established at levels that also "protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings."

In order to obtain a construction or operating permit from the Department, an applicant must make two primary demonstrations: 1) no applicable ambient air standards would be violated[5] when emissions from the proposed source are combined with background concentrations and concentrations resulting from other permitted stationary sources in the area, and 2) BACT would be applied to the proposed emissions sources to limit air emissions. Preliminary results of that application process indicate compliance with the above two requirements.

Projected compliance with the NAAQS and MAAQS is demonstrated using approved air dispersion computer models. These models require the user to enter pertinent data such as short-term pollutant emission rates; source characteristics such as location, release height, and physical attributes of the exhaust plume; elevation data describing the surrounding terrain; and hourly meteorological data including wind direction and speed, ambient air temperature, and stability characteristics.

The Department's modeling guidelines suggest modeling using five years of hourly National Weather Service meteorological data and comparing peak impacts from the modeled period against appropriate standards and thresholds. Preliminary modeling for this Project was conducted in accordance with this guideline.

The first step in the modeling demonstration is to compare peak predicted ground-level concentrations with modeling significance thresholds. These pollutant- and averaging period-specific values provide a threshold for further detailed modeling. If a source's impacts are below modeling significance, the source, by definition, would not cause or contribute to an exceedance of a standard if such an exceedance existed. No further modeling analyses are then required. Model results indicated that ground-level concentration impacts resulting from combustion turbine emissions are predicted to be insignificant for the pollutants and averaging periods for which significance levels are defined. Consequently, inclusion of surrounding emissions sources in the air quality impacts demonstration is not required.

Neither ambient air quality standards nor modeling significance levels are defined for lead, beryllium, fluorides, or mercury. These chemicals are associated with another concentration threshold by which a level of impact can be judged. Stationary sources that are subject to PSD regulations are required to monitor ambient concentrations of particular pollutants prior to applying for a permit unless certain exemptions apply. One of those exemptions is linked to model-predicted concentration impacts that are defined for several pollutants. If the peak

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4 Basin Electric would additionally apply to the US EPA for a permit in accordance with Title IV of the Clean Air Act (the Acid Rain Program). The Title IV permit would be incorporated into the Title V operating permit.

5 In the case of sources that are determined to be major stationary emissions sources in accordance with PSD air quality rules, the applicant must also demonstrate compliance with limits on incremental ambient concentration increases. They must further demonstrate compliance with regulatory and guideline limits on air quality related values. The Basin Electric CTG facility will not be a major PSD emissions source and is not required to make these demonstrations.

modeled impact of a pollutant is below its "monitoring *de minimis*" level, the applicant is exempted from monitoring for that pollutant. Monitoring *de minimis* levels are defined for several pollutants including lead, beryllium, fluorides, and mercury. The following table shows that peak model-predicted concentrations for these chemicals are well below their respective monitoring *de minimis* levels.

Pollutant	Averaging Period	Predicted Impact ($\mu g/m^3$)	Monitoring *De Minimis* Level ($\mu g/m^3$)
Pb	3-mo	3.36E-06	0.1
Hg	24-hr	3.43E-05	0.25
Be	24-hr	1.58E-06	0.001
F	24-hr	3.69E-07	0.25

As a consequence of construction and operating in accordance with air quality permit limits and conditions, Project-related impacts to air quality surrounding the Project would be minor. The no-action alternative would not directly affect this resource. Basin Electric and its contractors would use best management practices to limit fugitive dust during construction and operation of the Project. These practices would include: application of water and/or dust suppression chemicals to roadways and disturbed surfaces as needed; observance of speed limits on access roads to limit road dust generation; and reseeding or other stabilization of disturbed areas.

Montana air quality regulations require that all permitted stationary sources of air pollutants use BACT to control emissions. By definition, BACT is determined on a case-by-case basis. Typically, the Department has applied this requirement to criteria pollutants (PM_{10}, NO_x, CO, SO_2, and VOC) and has used its discretion to apply the requirement to specific pollutants of concern. For this Project, Basin Electric has determined the following controls are BACT for controlling emissions from the combustion turbine.

Pollutant	BACT
NO_x	Water injection into the combustor to achieve a maximum exhaust concentration level of 25 ppm.
CO and VOC	Catalytic oxidation with 90% control.
SO_2	Use of low-sulfur, pipeline quality natural gas; proper maintenance and operation.
PM_{10} / $PM_{2.5}$	Use of low-sulfur, pipeline quality natural gas; proper maintenance and operation.

New Source Performance Standard (NSPS) Subpart KKKK (40 CFR 60.4300 *et seq*.) is titled "Standards of Performance for Stationary Combustion Turbines." It applies to all stationary combustion turbines with a heat input at peak load equal to or greater than 10 MMBtu per hour and which commenced construction, modification, or reconstruction after February 18, 2005. Since the proposed combustion turbine would have a heat input capacity of 738.1 MMBtu/hr and would be a new unit, it would be subject to the limits and conditions of this NSPS. Those limits and conditions include specific emission rate limits and testing and monitoring requirements that would serve to mitigate and monitor air quality impacts. Basin Electric would comply with all applicable conditions and limits associated with NSPS Subpart KKKK.

Title IV of the Clean Air Act, commonly known as the Acid Rain Program, applies to electric generating units that generate more than 25 MW of electricity. The program establishes a nationwide cap on SO_2 emissions from affected sources, provides for an SO_2 emissions credit trading system, defines specific emissions limits for NO_x emissions from coal-fired facilities, and requires continuous monitoring. Basin Electric would comply with all applicable conditions and limits associated with the Acid Rain Program, thereby mitigating potential impacts to ambient air quality.

As mentioned, the existing air quality of the project area is classified as either "better than national standards" or unclassifiable/attainment with respect to NAAQS for all criteria pollutants. As part of Montana Air Quality Permit application #4256-00, Basin Electric submitted a modeling analysis of ambient air quality dispersion to estimate impacts of the project. The analysis demonstrated compliance with MAAQS, NAAQS, and PSD Class I and Class II increments. A complete description of the modeling is contained in Section VI of the Permit Analysis. Overall, due to compliance with standards and permit conditions, impacts to air quality are expected to be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

Significant adverse impacts to threatened or endangered species, or to species of concern, could result if a substantial proportion of the regional inventory of designated critical habitat used by these species for breeding, foraging, and refuge were to be altered or fragmented. Significant adverse impacts could also result if Project-related activities caused a loss of a population of individuals that would likely jeopardize the continued existence of any threatened or endangered species or species of concern.

For the purposes of this document, threatened or endangered species were considered to be those species recognized by USFWS as listed endangered, threatened, proposed or candidate under the Endangered Species Act (USFWS, 2008a). Four species are included for Roosevelt County: pallid sturgeon (*Scaphirhynchus albus*; Listed Endangered), whooping crane (*Grus americana*; Listed Endangered), interior least tern (*Sterna antillarum athalassos*; Listed Endangered) and piping plover (*Charadrius melodus*; Listed Threatened). In addition, critical habitat has been designated for the piping plover in Roosevelt County along the Missouri River (more than five miles from the nearest Project facility) and at Medicine Lake National Wildlife Refuge (more than 15 miles from the nearest Project facility). No other critical habitat has been designated within the region surrounding the Project area.

In the northern Great Plains the piping plover nests on riverine sandbars; wide, flat, open, sandy and sparsely vegetated beaches along inland lakes and reservoirs; gravel pits along rivers; and salt-encrusted bare areas of interior alkali wetlands and lakes (USFWS, 2008b). No such habitat is available in the Project action area.

Interior least terns nest on unvegetated sand-pebble beaches and islands of large reservoirs along the Missouri and Yellowstone River systems in northeastern and southeastern Montana. Sites with gravel substrate provide the most suitable sites for nesting. Two limiting factors to nest site selection are vegetation encroachment (terns avoid sites with comparatively thick vegetation) and surrounding water levels. Nests may be inundated by high water levels or beaches may be under water during the early part of, and possibly throughout, the nesting season (MTNHP, 2008a). No suitable interior least tern nesting habitat is available in or near the Project area. The Missouri River is about 5-6 miles south of the Project.

Whooping cranes formerly bred in isolated prairie marshes and aspen parklands. A map of former breeding range in CWS and FWS (2007) suggests they may never have nested in northeastern Montana. However, they are considered a rare migrant through Montana in spring and fall, feeding in a variety of croplands and roosting in marshy wetlands (MTNHP 2008b). The project area is located within the extreme western edge of the migration corridor (80 to 90 miles west of the corridor centerline) where less than ten percent of whooping crane sightings have occurred. Most (>70 percent) roosting sites are within 1 km (0.6 mile) of feeding sites (CWS and FWS, 2007). They have been recorded in the Medicine Lake National Wildlife Refuge complex (USFWS, 2008c), about 16 miles north of the Project.

Migrating whooping cranes could forage in cultivated fields in the Project vicinity; however, suitable whooping crane roosting habitat is not available in the Project area. There are no jurisdictional wetlands in the area, and the wetland areas that do exist are of marginal quality and less than one-tenth of an acre in size (WESTECH, 2008). There are no grain fields in the Project action area at present, although some of the fields currently seeded in introduced grasses/CRP were probably grain fields in the past (WESTECH, 2008). Grain fields are available within 1.0 mile.

The Project area includes no surface waters and is not expected to affect surface waters in the region. Consequently, the Project would not affect any population of pallid sturgeon.

As discussed above, the project area does not contain suitable roosting or foraging habitat for the interior least tern, the piping plover, or the whooping crane. It is possible that whooping cranes migrating through the area could collide with newly erected transmission lines. The probability of such collisions is small, however, due to the relatively short distance traversed by the transmission line, the location of the Project area on the fringe of the annual migration route, and the general lack of suitable roosting and feeding sites in the Project area.

Since no designated critical habitat for any threatened or endangered species exists in the area directly affected by the project, the project would not destroy or adversely modify designated critical habitat for any of these species and impacts would be minor.

For the purposes of this document, Species of Concern were those defined by the Montana Natural Heritage Program (MTNHP) as native Montana plants and animals that are considered to be at risk or potentially at risk due to declining population trends, threats to their habitats and/or limited distribution (MTNHP/MFWP 2006, MTNHP 2006). Forty species (2 mammals, 25 birds, 2 reptiles, 1 amphibian, 7 fish and 3 vascular plants) are listed for Roosevelt County, including threatened or endangered species. Two species (bobolink and Baird's sparrow) that are considered "species of concern" in Montana were observed during reconnaissance of the Project area. Bobolinks were common in the habitat produced by introduced grasses, and a single Baird's sparrow was recorded in a pasture that would not be directly affected by the Project.

The Project impact area is not suitable habitat for most of the Species of Concern potentially occurring in the region encompassing the Project, and is marginal habitat for others. Impacts to these species are not expected to be significant because construction activities will be limited in scope and duration, comparatively minor amounts of habitat will be permanently altered by the Project, and the Species of Concern most likely to be affected, the bobolink, is common in the area to be affected so any impacts would not jeopardize the local population. Further, operation activities will be primarily focused at the CTG site and, with only two full-time employees, will be non-invasive.

For these reasons, the Project would result in only minor adverse direct, indirect, or cumulative impact to any Species of Concern. The no-action alternative would not affect this resource in any way. Since impacts from development of the Project would be minor to threatened or endangered species or species of concern, no mitigation or monitoring would be required. Construction best management practices would be observed to minimize habitat disturbance during construction and to restore habitat not required for Project activities. Basin Electric would cooperate with the FWS as appropriate to identify and implement measures to further mitigate the risk of direct mortality resulting from whooping crane contact with overhead transmission lines.

H. Demands on Environmental Resource of Water, Air and Energy

As described in Section 7.B of this EA, impacts to area water resources would be minor because the demands for water would be relatively low and the resulting amount of wastewater generated would be small. Furthermore, Basin Electric is not proposing to directly discharge any material to surface or ground water resources in the area. Any wastewater produced would be disposed at a licensed off-site facility. In addition, as described in Section 7.F of this EA, any impact to the air resource in the area of the facility would be minor because the air emissions from the facility would be controlled and relatively low due to dispersion characteristics of the facility and local area. Furthermore, dispersion modeling demonstrates that emissions from the proposed facility would not exceed ambient air quality standards. As a result of the ambient air quality analysis summarized in Section 7.F of the EA and Section VI of the permit analysis, Permit #4256-00 would contain conditions limiting the emissions from the facility.

Impacts to energy resources would result from the use of natural gas to power the turbine generator. At full capacity, the facility would consume 738 MMBtu/hr to generate 100 MW of electricity. However, Permit #4256-00 would limit operations to 3,400 hours per year. Overall, due to limited operations and the relatively minor amount of natural gas consumption, demands for environmental resources of water, air, and energy would be minor.

I. Historical and Archaeological Sites

The Department contacted the Montana Historical Society, State Historic Preservation Office (SHPO) in an effort to identify any historical, archaeological, or paleontological sites or findings near the proposed project. SHPO records indicate there have been no previously recorded sites within the designated search locales. SHPO determined that a cultural resource inventory is unwarranted at this time. Another indicator of cultural or historic significance is listing or eligibility for listing on the National Register of Historic Places. No sites of archeological, tribal, or historical value that are listed or eligible for listing on the National Register of Historical Places (NRHP) have been identified that would be impacted by the project. The project is not known or anticipated to have any significant adverse cumulative effects on cultural resources.

Prior to commencing fieldwork, the Montana State Historic Preservation Office's Cultural Resources Annotated Bibliography System and Cultural Resources Information System databases were queried to determine if previous archaeological research had been conducted nearby. That file search revealed that five cultural resource projects had been completed in the area (Anderson, 1985; Passmann, 1999; Hall, 2002a; Brumley, 2005; Gray, 2007). Those resulted in the identification of cultural properties, including three small-scale historic coal mines, farmsteads, the Great Northern Railway, and an electric transmission line.

Only the transmission line lies in proximity to the Basin Electric's Project area. The Williston to Wolf Point line (24RV698) crosses the NE¼ Section 29, Township 28 North, Range 57 East, immediately south of the Substation site. That 115 kV line was originally installed in 1949;

however, it has undergone periodic maintenance and many poles, insulators, cross-arms, and braces have been replaced. Because the property has diminished integrity and lacks significance, its recorder determined it to be ineligible for National Register listing (Hall, 2002b:1-3). The line was recently reconstructed.

An intensive pedestrian cultural resource inventory of the Project area was conducted from April 21 to 24, 2008. The inventoried area included 80 acres within and surrounding the CTG facility in the W½NW¼ Section 5, Township 28 North, Range 57 East. The inventory covered 40 acres in the SE¼SE¼ Section 20, Township 28 North, Range 57 East at the planned Substation. Finally, the inventory covered an approximately 5-mile-long by 300-foot-wide corridor encompassing the Transmission Line that would run between the CTG facility and the Substation. The combined inventory covered 230 acres.

Fieldwork involved walking linear transects spaced between 15 and 30 meters apart within the Project parcels. Other than localized hay fields in Sections 5 and 8, tall grasses covered the inventory areas limiting ground surface exposure to about 5%. The inventory did not include sub-surface probing as part of the cultural resource inventory. Areas of exposed or disturbed sediments were closely inspected to determine if buried artifacts or features were present. Particular attention was paid to the numerous rodent burrows, which provided 100% ground surface exposure and localized views of subsurface sediments.

The field survey yielded two sites with potential historical and cultural significance, both historic farmsteads consisting of one or more standing buildings and associated features. The farmsteads lie within 300 feet of the Transmission Line corridor, near an existing county road. Both farmsteads are briefly described below. There are no cultural properties within the CTG facility or electrical Substation development parcels.

The Gobbs Farmstead lies about 1 mile north of the Substation in the NE¼NE¼ Section 20, Township 28 North, Range 57 East. It is about 200 feet west of a gravel county road and is accessed by a two-track driveway.

This farmstead was originally developed circa 1916 and abandoned some time around the 1940s. There are five historic features including a house foundation, three outbuildings, and a windmill on-site. The farm house's superstructure has been removed, leaving only a sunken basement and concrete footings to mark its former location. The specific design and materials of the building are unknown. It was razed in about the 1940s, and the remaining basement depression was later used as a dump. Historic materials observed inside the sunken basement include two sets of bed springs, glass mason jars, and numerous whiteware fragments.

One of the outbuildings is a wood frame outbuilding with a shed addition on its east side. The floor sills of the original building rest on mortared rubblestone footings, while the addition rests directly on the earth. The building's interior is subdivided into small stables, suggesting that it functioned as a sheep or pig barn at one time.

Another of the outbuildings is a 1½ story wood frame building with a hay loft. The floor joists rest on railroad tie supports, suggesting that the building had been moved to its present location from elsewhere. The interior has wood plank flooring and is divided into three large stalls. The building presumably functioned as a hay shed and livestock barn.

The final outbuilding is a very low, single story wood frame building that has almost entirely collapsed. The floor sills rest directly on the ground and there is no foundation. Because of the building's poor condition, its specific function is unknown.

The features described above are surrounded by a broad scatter of historic and modern farm equipment, fencing materials, and domestic refuse. Included are a number of horse-drawn farm implements such as a large thresher, two cultivators, two discs, a plow, and a rake. There are also several pieces of modern equipment including a small rubber-tired, hydraulic-powered hay bailer and a large trailer. Other modern remains are three 50-gallon oil drums, truck/tractor tires, railroad ties, and fencing material.

The Gobbs Farmstead has diminished historic integrity. The original farmhouse was razed long ago, leaving only a trash-filled basement to mark its former location. Likewise, at least one outbuilding has been moved to its present location from elsewhere. Removal and movement of important constituent elements of the property has comprehensively altered the historic arrangement of this small farmstead. As a result, the property has lost integrity of design and feeling and it has diminished integrity of workmanship.

This property is not recommended for listing in the National Register of Historic Places because it lacks significance and integrity. The property is associated with an important episode of regional history – namely early 20th century agricultural development in northeast Montana. This small farmstead is but one of many such operations established at that time, and it did not make an extraordinary contribution to regional agricultural development. It is not directly associated with any individual or group that was of importance during the historic period, so the property lacks significance. Additionally, the farmstead has lost its historic appearance due to the loss and/or movement of buildings. It no longer conveys its historic elements of design, workmanship, or feeling, and the property is not considered National Register eligible.

The Ross Farmstead is 1.2 miles north of the Gobbs place in the SE¼SE¼ of Section 8, Township 28 North, Range 57 East. It lies within Basin Electric's Transmission Line corridor approximately mid-way between the CTG facility and Substation developments.

This farmstead was originally developed circa 1914 and abandoned some time around the 1940s. There are four historic features on-site: a farmhouse, an outbuilding ruin, an outhouse, and a windmill. The farmhouse is a simple 1½ story wood-frame building with slightly newer porch additions on the west (rear) and south sides. Dry-laid stone piles support the floor sills at all four corners of the building. There is no basement, but an unlined earthen root cellar is accessed by a trap door in the plank flooring. Lap siding covers the original building's exterior walls, while the additions are clad with tongue and groove siding.

The outbuilding is a collapsed wood-frame structure of indeterminate design and function. It presently consists of a concentration of lumber, siding, and construction debris covering a rectangular area measuring about 15 x 20 feet.

The ruin of a small wood-frame building likely functioned as an outhouse. The building has fallen over and its exact design is unknown. It appears to have measured about 4 feet to the side and 6 feet in height. The collapsed superstructure obscures the privy pit that is presumed to have lain within the enclosure.

A windmill at the site was originally used to pump water from a well. The support structure and portions of the blade remain intact. It is of angle iron construction and is approximately 20 feet tall. The original pump and related hardware have been removed.

The site area has been largely cleared of debris, leaving only a few artifacts in a broad scatter surrounding the documented features. Observed historic remains include the axle of a horse-drawn trailer, three piles of lumber that were presumably salvaged from demolished buildings, and fencing materials. There are also a few modern items including a 5-gallon metal drum and a galvanized pail.

The Ross Farmstead has lost its integrity of feeling, design, materials, and workmanship because only one of its original buildings remains standing. The others have collapsed or were razed long ago, thus the historic arrangement of buildings at this small farmstead has been comprehensively altered.

This property is not recommended for listing in the National Register of Historic Places because it lacks significance and integrity. It is associated with an important episode of regional history – namely early 20th century agricultural development in northeast Montana. This small farmstead is but one of many such operations established at that time and it did not make an extraordinary contribution to regional agricultural development. It is not directly associated with any individual or group that was of importance during the historic period, so the property lacks significance. Additionally, the farmstead has lost its historic appearance due to the loss of most of its constituent buildings. It no longer conveys its historic elements of design, materials, workmanship, or feeling, and the property is not considered National Register eligible.

Because no cultural or historical resources of significance exist in the Project area, no impacts are expected and no mitigation or monitoring is required. If cultural, archeological, or historical resources are discovered during construction, intrusive work in the area would be discontinued until, through consultation with the Montana SHPO, the resource's significance was determined and mitigation plans were developed as necessary.

J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the physical and biological aspects of the human environment would be minor because the proposed impacts would be minor. The facility would be a relatively minor industrial source of emissions which would operate on a seasonal and intermittent basis. Permit conditions and statutory requirements ensure compliance with ambient air quality standards and use of BACT. Deposition of air pollutants would be minimized due to dispersion and emission controls. Modeling for the facility did not indicate the need for refined modeling that would take in to account the nearby compressor station; however, previous modeling for the compressor station indicated impacts to ambient air quality fell well below ambient standards.

8. *The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.*

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				X		Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production			X			Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities			X			Yes
G	Quantity and Distribution of Employment				X		Yes
H	Distribution of Population				X		Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity			X			Yes
K	Locally Adopted Environmental Plans and Goals				X		Yes
L	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS:
The following comments have been prepared by the Department.

A. Social Structures and Mores

The proposed project would not have any effect on social structures and mores of the proposed area of operation. The project area is located in a sparsely populated rural region, in an area whose predominant agricultural use would not change as a result of the proposed project. Further, the facility would be required to operate according to the conditions that would be placed in Permit #4256-00, which would limit the effects to social structures and mores because air emissions would be limited by compliance with the established permit conditions.

B. Cultural Uniqueness and Diversity

Facility operation would cause no disruption to the cultural uniqueness and diversity of the human environment in the area of operation because the source would be a minor industrial source of emissions which would operate on a seasonal and intermittent basis. The predominant use of the surrounding area would not change as a result of the proposed project.

Pursuant to Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, this section identifies and addresses any disproportionately high and adverse human health or environmental effects on minority or low-income populations from activities described in other sections of this Environmental Assessment.

The table below presents the population data by race for Roosevelt County, the town of Culbertson and the state of Montana.

	Total Population	Caucasian	African-American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islanders	Other (Single Race)	Other (Two or More Races)	Total Minority
State of Montana									
Total Population	902,195	817,229	2,692	56,068	4,691	470	5,315	15,730	84,966
Percent of Total Population	100.0	90.6	0.3	6.2	0.5	0.1	0.6	1.7	9.4
Roosevelt County, Montana									
Total Population	10,620	4,347	5	5,921	46	5	27	269	6,273
Percent of Total Population	100.0	40.9	0.1	55.8	0.4	0.1	0.3	2.5	59.1
Culbertson, Roosevelt County, Montana									
Total Population	716	641	2	43	2	0	6	22	75
Percent of Total Population	100.0	89.5	0.3	6.0	0.3	0.0	0.8	3.1	10.5
Source: Census 2000									

The largest minority population located in Roosevelt County is Native Americans. The majority of the Fort Peck Indian Reservation is located in Roosevelt County. The reservation is home to the Assiniboine and Sioux Tribes.

The total proportion of minorities in Roosevelt County is 59.1 percent, substantially more than the statewide proportion of minorities in Montana of 9.4 percent. The largest minority population located in Roosevelt County is Native Americans whose total proportion of the county population is 55.8 percent. The total proportion of families and individuals below the poverty level in Roosevelt County is 27.6 percent and 32.4 percent, respectively. The total proportion of families and individuals below the poverty level is greater in Roosevelt County than in the state of Montana.

No significant adverse impacts to the human environment would occur as a result of the Project. A disproportionate impact to human health or the environment on minorities or low-income populations would not result. In addition, no additional burdens would be imposed on local minority or low-income services as a result of the Project. The no-action alternative would not affect this resource in any way. The Project would have a positive impact on socioeconomic and community resources.

C. Local and State Tax Base and Tax Revenue

Because of the influx of capital and employment, the existing socioeconomic environment would be impacted to some degree. The increase in employment and expenditures from the construction and operation of the facility would be a direct impact to the community. Besides local expenditures by employees in the area, income may be generated in the community by the purchase of local construction material. When possible, a variety of construction materials, supplies, and fuel would be acquired in the area.

In general, however, socioeconomic impacts from the construction of the facility would be minor. It is anticipated there would be little additional demand on local facilities, services and utilities in the area. The temporary construction and permanent operational workforces are not large. Basin Electric would strive to hire as many qualified workers and contractors as possible from the region.

The temporary workforce should be accommodated in the area within existing housing and temporary housing, such as hotels, motels, and campgrounds. In addition, it is likely that some of the workforce may be native to the area.

Facility operations would have little, if any, impact on the local and state tax base and tax revenue because the facility would be a minor industrial source and would conduct only seasonal and intermittent operations. The facility would require the use of only a few employees. Thus, only minor impacts to the local and state tax base and revenue could be expected from the employees and facility production. No significant cumulative impacts on the existing infrastructure are expected to occur as a result of the Project.

D. Agricultural or Industrial Production

The Project could result in significant adverse impacts to regional land use if it caused a widespread and lasting change in the existing regime of land use. Of special concern in the Project area is impacts to existing farmland. None of the property in the Project area has been designated prime farmland. However, the CTG facility and a portion of the Transmission Line corridor would be located on farmland of statewide importance. Farmland of statewide importance must meet a variety of criteria primarily concerning soil characterization.

Prime farmland is defined in Section 1540(c)(1) of the Farmland Protection Policy Act (FPPA) as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor without intolerable soil erosion, as determined by the Secretary. Prime farmland includes land that possesses the above characteristics and is being used currently to produce livestock and timber. It does not include land that is already in or committed to urban development or water storage."

The FPPA is designed to protect farmland in general. As defined in 7 CFR Part 658.2(a), farmland includes prime or unique farmlands or farmland that is determined by the appropriate state or unit of local government agency or agencies, with concurrence of the Secretary, to be farmland of statewide or local importance. The federal government is not authorized to regulate the use of the private or nonfederal land or affect the property rights of owners. However, if a private party applies for federal assistance to convert farmland to a nonagricultural use, the federal government should use the criteria in 7 CFR Part 658.4 to take into account adverse effects and to develop alternative actions that would avoid or mitigate adverse effects.

In accordance with the FPPA regulations, Basin Electric has consulted with the appropriate NRCS personnel and jointly performed a Land Evaluation Site Assessment (LESA) to identify the relative value of the property that would be impacted. According to NRCS policy, if the analysis results in a score of 160 or more, the requesting federal agency should perform a study for the purpose of identifying potential alternatives to the Project that would have a lesser impact on farmland. The highest LESA analysis score for this Project was 155. Consequently, no further action was required.

No prime forest land or rangeland exists in the Project area. A variety of formally classified lands, including Native American reservations, wilderness areas, wildlife refuges, and BLM-administered lands exist within a radius of 20 miles from the Project. The Project itself would not contain any land that is formally classified or administered by federal or state governments. Tribal owned land is located directly east of the Substation site. The Fort Peck Assiniboine and Sioux Tribes have been informed of the Project but have not commented.

The Project would occupy landscape with a land use mixture of range land, pasture land, row crop land, hay fields, and wild grasslands. The land currently designated for the Project would occupy a landscape considered agricultural and consisting primarily of farming and ranch land. The Project would occupy only private land with unspecified zoning by Roosevelt County for land use plans and ordinances.

Farming is the principal enterprise in Roosevelt County near the Project. The number of farms and farm size is shown in the table below. Approximately 23% of farm sales derive from livestock and poultry. The remaining 77% percent of farm sales derives from crops such as barley, flaxseed, hay, lentils, oats, peas, safflower, sugar beets, and wheat (USDA, 2002).

Roosevelt County	**1987 Census[1]**	**1992 Census[1]**	**1997 Census[1]**	**2002 Census[2]**
Number of Farms	598	525	609	683
Land in Farms (acres)	1,364,020	1,414,415	1,430,064	1,441,479
Average Farm Size (acres)	2,281	2,694	2,348	2,111

1. Statistical data obtained from http://agcensus.mannlib.cornell.edu/.
2. Statistical data obtained from http://www.nass.usda.gov/Data_and_Statistics/index.asp.

Approximately 166 acres have been purchased for the CTG facility. The CTG facility is expected to occupy 95 total acres. The remaining 71 acres would be leased and likely re-enrolled into the Conservation Reserve Program (CRP). Approximately 20 acres would be purchased for the Substation. Ownership would be transferred to Western after construction was completed. Easements would be acquired for approximately 68 acres for the 125-foot wide Transmission Line right of way.

The 125-foot wide electrical Transmission Line corridor would follow existing section lines and be located only on agricultural land. The electrical Transmission Line corridor would not be expected to cross any public roads, and would cross only one private farm access road along its 4.5 mile length.

Because the property upon which the Project would locate is either undesignated farmland or farmland with marginal value, and because none of the properties is formally designated, no adverse direct, indirect, or cumulative impacts to land use in the Project area would result from construction or operation of the Project. The no-action alternative would not affect this resource in any way. No mitigation or monitoring measures are required since no adverse impacts are anticipated.

Impacts from the operation of this facility on agricultural and industrial production in the area would be minor because the facility would impact only a small amount of land (approximately 15 acres), the impact from the air emissions on the land would be small, and the amount of electricity produced to assist other industrial activities within the state would be relatively small when compared to existing Montana electric utilities. As described in Section 7.F of the EA and Section VI of the permit analysis, the air quality impacts from this facility would be minor and the resulting deposition of the pollutants from the facility would be similarly minor. In addition, as described in Section 7.F of this EA and Section VI of the permit analysis, the facility would comply with the NAAQS and MAAQS protect public health and promote public welfare, which indicates impacts from the facility would be minor. The facility may assist other industrial production because the electric power generated from the facility would be available to customers in Montana; however, when compared to existing electric utilities in Montana, the amount of new power available to industrial sources would be relatively small.

E. Human Health

The proposed project would result in the emission of air pollutants. However, Permit #4256-00 would include limits and conditions to ensure that the facility would be operated in compliance with all applicable air quality rules and standards. Basin Electric would be required to apply BACT and maintain compliance with all ambient air quality standards (including secondary standards). These standards are designed to be protective of human health. Overall, any air quality impacts to human health would be minor.

Additional health and human safety issues were reviewed to identify potential impacts related to electrical shock hazards and electric and magnetic field (EMF) exposure. Human health and safety impacts resulting from the Project could be significant if risks of electrical shock or health effects from EMFs increased measurably beyond existing risks and could not be mitigated below the level of significance. Current flows can pose a safety hazard from electrical shock that would occur due to contact with live electrical conductors or transmission lines. The only existing electrical shock hazards in the Project area are local electrical lines that run to existing farms and residences, and the 115 kV Western electrical transmission line located approximately 3½ miles south of the combustion turbine facility. These potential impacts would be mitigated by controlling access by unauthorized individuals.

Long-term exposure to EMFs induced from electrical currents and voltages have been postulated to affect human health and have been the subject of a number of scientific studies. Induced EMFs may be present in the vicinity of any live electrical conductor, transmission line, or end-use electrical equipment or appliance. Existing EMF exposure sources would be found near local electrical lines that run to existing farms and residences; around existing electrical equipment and appliances at these farms and residences; and near the 115 kV Western electrical transmission line located approximately 3½ miles south of the combustion turbine facility.

The vicinity of the CTG facility and associated Transmission Line was surveyed for places where people live, work or otherwise frequent regularly and for extended periods of time. These places include residential dwellings, schools or health care facilities.

The area surrounding the CTG facility and associated Transmission Line can be characterized as rural in nature, and is generally used for agriculture. Residences in the area are few and widely scattered. Reconnaissance of the area identified the following residences in proximity to the Project:

- 0.7 miles south
- 1.1 miles west-northwest
- 1.2 miles east-northeast
- 1.7 miles northeast

No residences are located within several miles of the Substation. Both the Substation and the Transmission Line (for most of its length) are adjacent to an unpaved county road.

A review of maps and information from several databases did not identify any public schools or health care facilities in the vicinity of the CTG facility, the electrical Substation, or along the electrical Transmission Line corridor.

Potential health effects of extremely low frequency (ELF) EMFs near electrical devices and power lines have been the subject of public concern and of ongoing research and study. A 1999 report by the National Institute of Environmental Health Sciences (NIEHS) concluded the scientific evidence is weak that suggests ELF-EMF exposures pose any health risk (NIEHS, 1999). Some association between exposure of human populations and cancer risk was found through epidemiological studies; however, that association was not corroborated by experimental data. The NIEHS scientists stated that "the interaction of humans with ELF-EMF is complicated and will undoubtedly continue to be an area of public concern." They recommend continued emphasis on educating the public and the regulated community on means of reducing exposures.

The potential for EMF exposure from the CTG facility and associated Transmission Line is greatly diminished since the Project would be located in a rural, undeveloped area with significant buffer distances to the nearest residences. Exposures to EMFs in the immediate vicinity of generation and transmission equipment would be limited by controlling access to those facilities. For these reasons, direct, indirect, and cumulative impacts are not anticipated to be significant. The no-action alternative would not affect this resource in any way.

Basin Electric would limit public access to the CTG facility and Substation by a locked chain link fence with barbed wire at the fence top around the perimeter of the entire installation. Electrical connections and switchgear that connect these facilities to the electrical Transmission Line system would be located within the facility perimeter fence and would be inaccessible to the general public. Only authorized entry of electrical safety-trained personnel would be allowed inside the bounds of the facility. Safety signs warning of the imminent danger from electrical shock within the facility bounds would be affixed to the perimeter fence exterior.

The electrical Transmission Line from the CTG station to the electrical Substation is accessible only by climbing up Transmission Line support structures.

All of Basin Electric's and Western's transmission lines are designed and constructed in accordance with National Electric Safety Code (NESC) standards to minimize shock hazard. Construction of the Project would comply with all NESC standards to ensure that the Project meets safety and electrical hazard standards. This would include standard grounding practices to minimize the possibility of nuisance shocks caused by induced currents from stationary objects such as parallel wire fences.

F. Access to and Quality of Recreational and Wilderness Activities

The proposed turbine generator facility will be located approximately 7.2 miles northeast of Culbertson, Montana, about 16 miles due west of the Montana-North Dakota border, in Roosevelt County, Montana. The closest PSD Class I areas are the Fort Peck Indian Reservation (FPIR) at approximately 10.8 miles away minimum distance, and the Medicine Lake Wilderness Area (MLWA) at approximately 14.5 miles away minimum distance.

Dispersion modeling examined the annual average NOx impacts on FPIR and MLWA since the peak modeled annual NOx concentration was 0.17 μg/m3, which is greater than the Class I significance level of 0.1 μg/m3. The 0.1 μg/m3 annual NOx isopleth was well over 15 km away from either Class I area. In addition, the Department modeled potential impacts of the 24-hour and annual $PM_{2.5}$ emissions on the two Class I areas using the Department default significance levels values of 0.07 and 0.06 μg/m3, respectively. The results were significantly lower than either level at both Class I areas. Furthermore, neither of these criteria pollutants exceeded the Class II significance levels (see Section 7.F of this EA and Section VI of the permit analysis).

The proposed facility would result in minor, if any, impacts to access and quality of recreational and wilderness activities because of the location and relatively small size of the facility. In addition, air emissions from the facility would be relatively minor and would disperse before impacting the recreational areas.

G. Quantity and Distribution of Employment

It is estimated that approximately 150 people would be employed for the construction phase of the gas turbine while approximately 40 people would be employed for the transmission interconnection construction activities. The total construction time for the Project is expected to be up to 15 months. Approximately two people would be employed full-time during operation of the facility. Overall, the Project would have only a minor impact on the quantity and distribution of employment.

H. Distribution of Population

The closest residence to the CTG facility is located approximately 0.75 miles to the southwest. The closest residence to the Substation is located approximately 0.85 miles to the southwest of the Substation property. The closest businesses are located in Culbertson, with a population of 716, located approximately 7 miles southwest of the site. The proposed operations would not disrupt the normal population distribution in any given area. The proposed facility would require only a few employees to operate the equipment. Because operations are seasonal and intermittent, no individuals would be expected to permanently relocate to any area as a result of operating the facility.

The Project is located in Roosevelt County, Montana. In 2000, Roosevelt County had a population of 10,620 which had decreased from 1990 by 379 people. The nearest town to the Project is Culbertson, which is located approximately 7 miles to the southwest. With a 2006 population of 4,804, the closest urban cluster is Sidney, Montana. With a 2006 population of 58,333, the closest Urban Area is Bismarck, North Dakota. The U.S. Census Bureau defines an Urban Cluster as an area with a population of 2,500 to 50,000 people and an Urban Area as an area with a population greater than 50,000 people.

The long-term effect on the area's population would be minor because only approximately two jobs would be directly created. The permanent workforce should be accommodated within existing housing in the area.

I. Demands for Government Services

Minor increases would be seen in traffic on existing roadways in the area while the facility is constructed. In addition, government services would be required for acquiring the appropriate permits for the proposed project and to verify compliance with the permits that would be issued. Because the facility would pay relatively high taxes and would require few government services, the effects on government services from this facility would be minor. Overall, any demands for government services would be minor.

J. Industrial and Commercial Activity

Overall, the facility would represent a minor increase in industrial and commercial activity in the area. Construction activities associated with the facility would result in temporary increases in commercial activity. In addition, the production of electrical power may result in additional industrial activity due to the availability of local power. However, the electrical production capacity from the proposed facility is relatively minor when compared to existing Montana utilities. Overall, any impact to local industrial and commercial activity would be minor.

K. Locally Adopted Environmental Plans and Goals

Permit #4256-00 would contain limits for protecting air quality and for ensuring facility emissions are in compliance with any applicable ambient air quality standards. Because the facility would have intermittent and seasonal operations, any impacts from the facility would be minor and short-lived. The Department is unaware of any local environmental plans or goals. Permit #4256-00 would be protective of the local areas.

L. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the social and economic aspects of the human environment would be minor. Several new full-time employment opportunities would result, many temporary construction related employment opportunities would be available, and the facility would sell power to other residents and industries in the region. The source would be a seasonal and intermittent in operation, and would cause minor increases in traffic in the immediate area. Because the source is relatively small, only minor economic impacts to the local economy would be expected from operating the facility.

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Recommendation: No Environmental Impact Statement (EIS) is required. Permit #4256-00 includes conditions and limitations to ensure the facility will operate in compliance with all applicable air quality rules and regulations. In addition, all impacts associated with the proposed action are expected to be insignificant or minor.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office; Natural Resource Information System – Montana Natural Heritage Program; USDA Rural Utilities Service.

Individuals or groups contributing to this EA: Bison Engineering, Inc.; Montana Department of Environmental Quality–Air Resources Management Bureau; Montana Historical Society–State Historic Preservation Office; Montana Natural Heritage Program–Natural Resource Information System; USDA Rural Utilities Service.

EA prepared by: Brent Lignell
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